economic Shocks

Defining a Role for Government

Edward M. Iacobucci,
Michael J. Trebilcock,
and
Huma Haider

C.D. Howe Institute

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Policy Study 35

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Foreword

Abrupt economic changes, or shocks, are by definition unexpected events. But what should be anticipated is that shocks of one kind or another will occur over time, and it is thus important to have a process in place that allows for an appropriate policy response when such events occur.

This study, by Edward Iacobucci, Michael Trebilcock, and Huma Haider, provides a comprehensive discussion of the various types of shocks that can affect the economy, and considers the role of government in addressing the problems that arise from them. The authors provide a useful classification of shocks — natural, market, and government-induced — and characterize the policy responses that can be used to deal with each type of shock.

A key element is to distinguish between *ex ante* and *ex post* policies and how they might effect market responses to shocks. *Ex ante* policies, including flood works, insurance programs, and information systems, are put in place before a shock occurs in order to alleviate the negative impacts or avoid the shock altogether. *Ex post* policies, such as relief payments and retraining, are invoked in response to a shock but cannot prevent it.

An evaluation of several case studies reveals that governments can sometimes worsen, rather than alleviate, the impact of shocks. For example, responses to the oil price shocks of the 1970s failed to achieve normative objectives: price controls reduced incentives to find new sources of energy and were poorly targeted since everyone was protected from higher prices, not just the poor. And government negligence in managing the east coast cod stock led to the adoption of relief programs, but these have not been successful in addressing problems of unemployment since they did not help people with relocation or retraining.

I believe this monograph makes an important contribution to the understanding of the role of government in dealing with economic shocks. The C.D. Howe Institute would like to thank the Law Commission of Canada — particularly its executive director, Bruno Bonneville — for financial support of the publication of this volume.

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Jack M. Mintz
President and
Chief Executive Officer

The Study in Brief

The objective of this study is to ascertain the appropriate role for government in responding to economic shocks. Economic changes can be thought of as lying along a continuum, from those that affect only an individual (such as loss of employment) to those that affect a significant subset of the population. Although this continuum suggests that a precise definition is unavailable, for the purposes of this monograph a change is considered an *economic shock* if it results in acute economic dislocations that are correlated across a significant portion of the populace of a region or economic sector. Thus, economic shocks lie at the extreme end of the continuum of change. Such a definition is appropriate for the study because far-reaching economic effects of this kind may, on a variety of normative rationales, be seen as too harsh for those affected for society to do nothing in response.

The study embarks on four main avenues of inquiry. First, it develops a taxonomy of shocks according to their source. Second, it outlines a variety of normative rationales that may, depending on the circumstances, justify some form of government intervention in response to a shock. Third, it describes the policy tools that are available to governments considering intervention. Then, it presents five case studies of shocks and governmental responses. The conclusion draws on the theoretical and empirical discussion to offer some lessons for policymakers.

Analysis reveals three sources of economic shock: nature, the market, and government. In the category of natural shocks lie natural disasters such as floods, earthquakes, and droughts, each of which can lead to extreme economic hardship for an entire region. Domestic and international markets can lead to economic shocks in a variety of ways. Domestic shifts in supply, such as those resulting from a change in technology, can be a boon for some people but a bane for entire sectors of the economy. Shifts in domestic demand can also lead to a shock. Internationally, shocks may arise because of shifts in comparative advantage or because of changing economic conditions, such as recessions, abroad. The final category of shock arises when a change in government policy harms a sector of the economy. For example, trade liberalization can create significant hardship for those industries that lack a comparative advantage relative to the new trading partner. Government mismanagement can also create economic shocks, as has been the case in the east coast cod fishery.

A variety of normative rationales are relevant to the case for government intervention in the face of shocks, and the study examines several. An efficiency perspective may favor intervention if market failures (such as insurance market failures) are present. Proponents of distributive justice tend to favor intervention if the shock harms those who are already not well off. The libertarian and corrective justice rationales generally oppose intervention unless the shock is caused by a wrong, perhaps on the part of government. Advocates of compensatory justice may support intervention to redress historical wrongs to groups that continue to suffer from them. Finally, communitarians are concerned about the preservation and encouragement of communities, which an economic shock may threaten.

The case for intervention depends on both the motivating normative rationale and the type of shock. Natural shocks, for example, are unlikely to attract interventionist recommendations from those who hold a libertarian or corrective justice viewpoint. On the other hand, shocks caused by government negligence may attract support for intervention from both perspectives. Efficiency advocates are unlikely to intervene in the face of most market shocks, given that the market is generally more effective than government in maximizing wealth. They may, however, recommend intervention in the face of natural shocks if market failure, particularly in insurance markets, precludes private preparations for the shock. Communitarians probably care least about the source of the shock, concerned as they are with its consequences for the vibrancy of an existing community.

A sizable range of policy tools is available to governments considering intervention. *Ex ante* tools — such as floodworks, subsidized information provision, and tax incentives — are implemented ahead of the shock to avoid or at least mitigate its effects.

Ex post tools — such as relief payments, retraining, and relocation assistance — come on the heels of the shock. Just as the normative case for intervention depends on the type of shock, the appropriate policy tool depends on the normative rationales relevant to the case for intervention. For example, *ex post* tools such as relief payments tend to run afoul of efficiency, given that parties anticipating such relief may not adjust their behavior to mitigate the effects of a future shock. On the other hand, communitarians, concerned about the preservation of a community's way of life, may view *ex post* relief as optimal.

The case studies reveal that governments, when intervening in the face of shocks, often do not succeed in advancing any of the rationales that would support such action. In examining natural shocks, we consider the experience in dealing with floods in the United States and Canada. In both countries, *ex post* government relief, in the form of subsidies and payments, has tended to crowd out private means (such as insurance) of dealing with potential flood damage. On the other hand, *ex ante* structural measures, such as the floodway in Winnipeg, seem to be effective in limiting the damage of flooding.

In responding to the two types of market shock this study examines — the 1970s' oil shocks and agricultural price volatility — governments did not do particularly well. As a response to the 1973 oil shock, price controls tended to exacerbate the dislocation by diminishing incentives to find new sources of energy. Moreover, controls could advance distributive justice concerns only crudely, given that they kept oil prices low for everyone, not just the poor. Marketing boards, the policy instrument of choice in dealing with agricultural price volatility, tend to favor large commercial farms, thus failing to advance communitarian and distributive concerns.

Government negligence in managing the cod stock was an apparent cause of the collapse of the east coast cod fishery, which the study consequently considers to be a government shock. Government is probably justified in providing fishery workers with some relief, perhaps to deter future negligence, perhaps as a matter of corrective justice, perhaps as a matter of distributive justice. Relief designed simply to preserve fishing communities, without addressing the problem of unemployment, has not proven successful, and these communities continue to shrink. Assistance with relocation or retraining is more likely to be successful, although experience with such programs reveals that they tend to have high numbers of dropouts and low job-placement rates.

Another government shock comes from trade liberalization. Easing the transition to freer trade through compensation of those harmed may be pragmatic in increasing support for welfare-enhancing liberalization; it may also be justified on distributive or communitarian grounds. Retraining has often been the policy tool chosen to ease the transition but, as noted, these programs are rarely unqualified successes.

In conclusion, a variety of normative rationales may justify government intervention in the face of natural shocks, market shocks, or government shocks. The means of intervention are also varied. Case studies of floods, oil and agricultural price volatility, mismanagement of the cod fishery, and trade liberalization reveal that governments often do intervene in the face of shocks. The most successful interventions do not attempt to defy an efficient allocation of resources in response to a shock. Thus, the evidence does not support relief payments after a flood; they simply result in higher costs from floods, since inhabitants of a floodplain anticipate the payments and do not adjust their behavior. A floodway, particularly if financed by those living on the floodplain, is more likely to offer an efficient solution. Interventions may be justified on the basis of distributive justice, but the case studies suggest that governments often fail to target assistance. For example, support to farmers historically has failed to target family farmers but rather has benefited both small farms and large commercial farms. Finally, while communitarianism may justify intervention in some instances, assistance designed to preserve a community without addressing long-term adjustment issues is probably doomed to failure. Cash transfers, rather than retraining, are unlikely to solve a community's problems.

Empirically, government programs in the face of shocks have not always been successful, and an omnipresent risk is that governments, perhaps because of interest group capture, will do society more harm than good when intervening. Nevertheless, we conclude that there will inevitably be some government intervention, often with a normative justification. Interest group influence will also tend to result in intervention. Policymakers and their scrutineers should, however, discipline the process by asking the right questions. First, what is the normative objective of the intervention? Finding the answer entails asking whether intervention is justified at all and whether government has available policy instruments that will advance the normative goal in question. Second, what policy instrument is most appropriate? Will it further the normative objective or hinder it? And what public and private costs will arise with its use? Although no one can guarantee that governments will not act in perverse ways, asking the correct questions can help to discipline them in responding to shocks. The case studies reveal that such discipline is needed.

Edward M. Iacobucci,
Michael J. Trebilcock,
Huma Haider
July 2001

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Introduction

Considerable economic upheaval is common in today's world. Some forces of change, such as those of nature, have always existed, and others, even if not really new, are accelerating in their impact. The increasing interdependence of economies through trade and investment liberalization, for example, had a profound transformational impact in the latter years of the twentieth century, and its importance is likely only to increase in the coming years. The case of technological transformations is similar. These upheavals create significant economic dislocations for individuals and communities within a given society, and citizens often call on government to mitigate their effects.

Economic changes can be thought of as lying on a continuum, from those that affect only an individual, such as a person's losing her job, to those that affect a significant subset of the population. In this study, we examine the role of government in responding to what we call *economic shocks* — acute economic dislocations that are correlated across a significant portion of the populace within a region (city, province, or country) or economic sector. We focus on this definition because citizens and governments may, on a variety of normative rationales, see such sharp and far-reaching effects as too harsh for society to do nothing in response. Moreover, the high correlation of harm across a large number of people and the acuteness of the effects often suggest that the policy instruments of the social safety net, such as unemployment insurance or welfare, are inadequate to cope with the scale of the economic dislocation. In summary, while economic change is constant, particularly in an era of rapid technological change, this study focuses only on acute, highly correlated change and its economic effects (rather than, say, the implications for human health of a natural disaster).

Clearly, governments often do intervene in response to all manner of economic shocks. This positive phenomenon invites an examination of the normative rationales for such public intervention, as well as the optimal type of intervention.

The study is divided into ten chapters. Chapter 2 provides a taxonomy of economic shocks classified according to three common causes: nature, the market itself (through, for example, changing technology or corporate mismanagement), and government-created dislocations (by, for example, a policy change or government's own mismanagement).

These three general causes of economic shocks allow characterization that is useful in considering the normative basis for intervention. The strength of the case for public intervention based on the various rationales we consider below may vary with the type of economic shock. For example, as we discuss, libertarianism, corrective justice, and compensatory justice focus on wrongdoing as central to an analysis of whether compensation of some form is justified for an economic shock. On this criterion, natural shocks rarely require public intervention, while those caused by private or government negligence may. As another example, private insurance may not be available against certain types of shocks, such as government shocks like a change in trade policy, while it may be available to some extent with respect to others, such as natural shocks. Efficiency theorists look to market failures, such as the unavailability of insurance, as central to any justification for intervention. On the other hand, political reality may require compensation for those harmed by some kinds of economic shocks even if they are, on net, beneficial to society. In other words, compensation for government shocks such as trade liberalization may be appropriate to minimize political resistance to a socially beneficial change, but such considerations do not apply to natural shocks or most market shocks; a change in consumer demand for a product will take place notwithstanding political resistance.

Chapter 3 discusses various normative rationales for government intervention in response to economic shocks. We review a variety of perspectives that may justify or oppose intervention. Along with overviews of these perspectives, we describe how they relate to the different kinds of shocks identified in Chapter 2.

Chapter 4 examines various policy instruments designed to address economic shocks. That is, its inquiry focuses on what policy instruments government should use on the assumption that intervention of some kind is warranted. The types of intervention divide roughly into *ex ante instruments*, designed to limit the likelihood (or the effects) of economic shocks before they occur, and *ex post instruments*, designed to ameliorate the effects of shocks after they occur. An example of an *ex ante* policy instrument is the construction of a floodway to prevent damage from flooding; an example of an *ex post* instrument is the payment of cash to those who have suffered economic losses from flooding.

Most of the remaining chapters are a series of case studies designed to examine the actual and potential responses of government to a variety of economic shocks. Chapter 5 addresses natural shocks: specifically, flooding in the US midwest and southern Manitoba. Chapters 6 and 7 look at two market shocks that differed in their effects on consumers and producers. Chapter 6 examines the oil shocks of the 1970s, which by and large harmed consumers through higher prices, although domestic producers of oil actually benefited. Chapter 7 turns to collapses in prices for agricultural products, which by and large have harmed agricultural producers and benefited consumers. We then examine government shocks. Chapter 8 considers the shock at least partially due to government mismanagement of the cod stock in the Atlantic fisheries. And Chapter 9 focuses on shocks that have resulted from government's acting in pursuit of what is likely, on balance, a socially desirable objective: trade liberalization. The differences in types of government shock may inform the analysis of intervention. Helping those harmed by fisheries mismanagement, for example, may internalize the costs of harm to government and deter future mismanagement, while internalizing the costs of trade liberalization may deter future transitions even if they are socially beneficial.

Chapter 10 discusses the dangers of any form of government intervention, given the risks of capture by interest groups. They may lobby for government assistance in response to shocks even where the intervention has little normative support. Mindful of this danger, we conclude that, when contemplating intervention, governments and those scrutinizing public policies must ask the right questions. Drawing on the discussion in the study, we set out some of those questions, which can help to provide guidance and discipline to policymakers who are considering responses to economic shocks. The concluding chapter also describes some of the lessons for policymakers that the case studies provide.

2 Taxonomy of Economic Shocks

Before examining the different sources of economic shocks, it is necessary to define an economic shock. The term is difficult to define precisely because, as already noted, changes lie on a continuum in the range of their impact. For the purposes of this study, we use *shock* to refer to losses that are correlated across a group of economic actors. In other words, it adversely affects a significant subset of people, such as workers in the case of plant closures, but does not include an isolated injury or setback to one individual. An *economic shock* is one in which losses are mostly financial, involving the loss of property, corporate revenue, income-earning potential, or future monetary expectations.

A broad investigation of economic shocks reveals three primary types: natural shocks, market shocks, and government shocks. Natural shocks entail uncontrollable, exogenous "acts of God," such as earthquakes, floods, fires, tornadoes, and storms, which produce devastating blows to a region's people and economy. Market shocks, in contrast, may be domestic or international. Domestic market shocks result from domestic human agents' activities or choices, such as technological change, demographics, labor unrest, new competition, changes in input prices and market demand, and corporate mismanagement. With increasing globalization, many of the reasons behind shocks, such as technological change, variation in input prices, and new competition, stem from pressures and changes in the international economy.

The third category is government shocks, largely from governmental policy shifts and ongoing policy administration. Changes in government regulations may result in loss of property or a loss in the use and value of property (discussed below under the heading "Regulatory Takings"). In addition, government policies such as trade liberalization, deregulation, and privatization can produce shocks to certain sectors of the economy. Like market shocks, these domestic policies may be influenced by international competitive pressures. Government mismanagement in policy administration may be another source of economic shock.

A more detailed examination of these three broad categories of economic shocks follows.

Natural Shocks

Canadians are fortunate to have escaped many grave disasters, such as devastating earthquakes, volcanic eruptions, cyclones, and typhoons, which have plagued other countries (Jones 1998). Nonetheless, Canada clearly is not immune to natural disasters. In the past decade alone, many people suffered from the Saguenay flood in Quebec, the Red River flood in Manitoba, and the 1998 ice storm in eastern Canada. In 1999, there was concern that drought and forest fires in northern parts of Ontario would cause grievous damage to farmers and their land (McAndrew 1999, A2).

Natural disasters are responsible not only for tragic loss of life but also for major loss of property and disruption of economic activity. Birkland estimates that hurricane Hugo and the Loma Prieta earthquake, which both occurred in 1989, were responsible for more than US$15 billion in direct property damage in South Carolina and northern California, respectively (1997, 47). In general, Dacy and Kunreuther maintain, natural disasters that result in the "destruction of commercial and industrial plants would deal a crippling blow to the output capability of the area" hit (1969, 4, 72). Physical damage to services, such as transportation, electricity, sanitation, and communications, which Tierney, Nigg, and Dahlhamer refer to as "lifeline services" (1996, 216), result in detrimental disturbances to community and business. If firms that depend on a steady cash flow are forced to close down for any amount of time, they may have trouble remaining viable; thus, smaller businesses often suffer greater losses than larger firms. After especially destructive events, repairing infrastructure may take months, leaving water shortages, sanitation problems, power outages, and broken gas lines for extended periods of time (Birkland 1997, 47).

A brief survey of several disasters provides evidence of severe losses. The 1995 Kobe earthquake "destroyed or severely damaged tens of thousands of businesses, disrupted highways and rail lines along one of Japan's busiest transportation corridors, and crippled the port of Kobe," resulting in direct losses of about US$120 billion (Tierney, Nigg, and Dahlhamer 1996, 216–217). Entire industries can be devastated, as was the case in 1992 with hurricane Andrew, which caused approximately US$206 million in damage to the nursery industry in Florida, including inventory losses and structural destruction; in addition, US$155 million was lost in local economic activity (Adamczak 1994). Table 1 reports a study of the 1993 flood in the midwestern United States, which reveals that many businesses that did not suffer property damage were still forced to close because of lifeline services outages (Tierney, Nigg, and Dahlhamer 1996, 216–217, 230). In 1999, tornadoes in Oklahoma affected at least 124 businesses, severely damaging at least 20 (Parrott 1999).

In Canada in the past decade, natural disasters greatly affected the agricultural industry. About 200,000 hectares, 5 percent of Manitoba's farmland, were inundated by water during the 1997 Red River flood. Dairy cattle were displaced and milk production dropped an estimated 25 to 45 percent.[1] In a report on the effects of

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[1] "Assistance fund created for Manitoba farmers," Canadian Press, May 8, 1997; available from Internet website: www.canoe.com/flood/may8_assistance. html; accessed July 1999.

Table 1: ***Survey of Businesses in Des Moines and Polk County, Iowa, after the 1993 Midwest Flood***

	Lifeline Service Interruption					Forced to Close	
Economic Sector	**Electric**	**Water**	**Phone**	**Sewer**	**Gas**	**%**	**Median Hours**
			(percent)				
Wholesale and retail trade	29.8	79.7	21.0	39.2	3.0	42.5	72
Manufacturing and construction	41.1	82.4	32.2	34.5	12.4	51.1	72
Business and professional services	36.7	79.7	23.1	43.0	7.5	45.6	120
Finance, insurance, real estate	36.9	78.0	24.6	44.2	3.0	39.9	72
Other[a]	25.2	82.3	13.0	33.8	6.2	24.2	—
All businesses	34.6	80.2	2.1	39.9	6.4	42.3	96

[a] "Other" consists of agricultural, fishing, forestry, mining, transportation, and public communication firms.

Source: Tierney, Nigg, and Dahlhamer 1996, 225–227.

the January 1998 ice storm in eastern Canada, Statistics Canada noted that close to one-quarter of Canada's dairy cattle were rendered vulnerable to disease owing to the lack of regular mechanized milking, and more than 10 million liters of milk had to be dumped from milk-processing plants. In addition, more than a third of the cropland in Quebec and one-quarter of that in Ontario was hit by the storm, causing severe losses to farmers (Statistics Canada, cited in Bueckert 1998).

Natural shocks can be especially devastating to areas that already face economic difficulties. Chicoutimi and Jonquière in the Saguenay region of Quebec were suffering from a 14.7 percent unemployment rate, the highest among major Canadian urban centers, when floods ravaged the region in 1997 (Branswell and Fisher 1998, 22–25). Homes and cottages were destroyed, and the lack of utilities and transportation affected industry. Paper companies Abitibi-Price and Stone Consolidated had to close their two plants for four to six weeks, leaving 1,500 employees out of work. Another 2,500 workers were left idle as the plants' suppliers, including sawmills, were also shut down. Moreover, the floods hit during the region's peak tourist season, generating a loss as high as $5 million a day in industry revenue (ibid.).

Market Shocks

Conceptually, disruptions in the market can be divided into domestic and international shocks, although, as already noted, the line between the two is blurring with increased globalization.

Domestic Shocks

Canada's economy, like others around the world, has experienced extensive changes and shocks over the years due to factors such as technological change, input price variation, shifts in consumer demand, new competition, and labor unrest. In addition, local economies have suffered grave setbacks from corporate mismanagement — the fishery and mining industries provide examples.

Changes in Technology

Much of the wealth of the world economy lies in knowledge, information, and technology industries. The diffusion of technology into established industries "involves a major upheaval in all sectors of the economy and changes in the skill profile and capital stock throughout the system" (Freeman and Perez 1988, 67). The manufacturing sector was the first to be transformed by such changes, partly due to external competitive pressures; then came the services sector, chiefly banking and finance.

With increased automation, especially in factories, employees in labor-intensive manufacturing industries have been displaced, and the trend is expected to persist.[2] Moreover, without education or skills to succeed in the increasingly knowledge-based international economy, unskilled and semi-skilled workers face long-term unemployment prospects, and many drop out of the labor force completely (Higgins 1994, 108). A 1991 study by the Brookings Institution demonstrates that almost all of the long-term rise in the unemployment rate fell on less-skilled workers, while demand has shifted to the better skilled (see Juhn et al., cited in Higgins 1994). With respect to the increase in wage inequality in the 1980s, the majority view that seemed to be emerging among labor economists by the early 1990s was that "the principal cause had been skill-biased technical change that had increased the relative demand for more educated and experienced workers and decreased that for others" (Cline 1997, 49). Thus, in addition to the problem of unemployment, less-skilled workers who remain employed may suffer a decline in wages: "real wages appear to have fallen persistently and sharply over the past two decades for those with high school or less education and even for those with some college" (ibid., 254).

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[2] "Workforce 2020: A Vision of the Future," *Worklife Report* 10 (1997): 11–12.

It is important to note, however, that this increase in wage inequality has been less pronounced in Canada than in the United States or the United Kingdom. A study of changes in wage distributions between 1981 and 1992 demonstrates that those in Canada were much less unequal than those in the United States, with Canadian measures of inequality 10 to 20 percent below US measures (Richardson 1997, 642). Dinardo and Lemieux attribute this development largely to the difference in the status of unions in the respective countries; they cite research suggesting that between 10 and 20 percent of the increase in wage inequality among men in the United States and the United Kingdom can be explained by the decline in unionization in these two countries during the 1980s, whereas unionization rates remained roughly constant in Canada (1997, 630–632). Nonetheless, unions in Canada have not been able to avoid the effects of technological change, and many workers have fallen victim to such advances.

Furthermore, technological labor displacement has resulted in exceptional hardship in single-industry towns. For example, the resource towns of Chemainus and Port Alberni, British Columbia, were each highly dependent on a particular milling enterprise. The one in Chemainus was owned by MacMillan Bloedel but was taken over by Noranda in 1981. In 1982, the mill was shut down due to declining profitability, largely as a result of external changes in the staples market, rendering 654 workers unemployed. In 1985, after having undergone extensive restructuring and technological change in order to minimize labor costs, the mill reopened. However, management introduced computers to handle many of the operations and laser-sensing devices to examine the logs. As a result, only 125 people were offered jobs, less than 20 percent of the number formerly employed in the predominant industry of the small town. Similar troubles plagued Port Alberni. Its saw mill and affiliated pulp mill provided the primary source of jobs in the entire region. MacMillan Bloedel employed almost 6,000 people in a community of about 20,000. Much as happened in Chemainus, changes in the external market and changes in technology left 2,600 unemployed, with grave repercussions for the entire town and region (Britton 1996, 61–64).

Variations in Input Costs

Among the most dramatic shocks to input costs were the oil crises of the 1970s, which contributed to global recession in the 1980s. The 1973 and 1979 rises in the price of petroleum and, consequently, of its substitutes produced inflationary effects and unemployment, resulting in a period of stagflation. Tsai notes that "in industries adversely affected by the rising oil prices, workers who were unwilling or unable to retrain or relocate faced structural unemployment" (1989, 226).

The oil shocks affected not only the oil industry itself but also industries such as coal, chemicals, metals, iron, and steel, in which energy was a major input (Jensen 1993, cited in Mitchell and Mulherin 1996, 214; Weston et al., cited in ibid., 198). In addition, the structure of domestic demand was altered in oil-importing countries such as Canada. The winners were the domestic energy sectors as their products were substituted for imported energy products. The market share of oil declined, whereas the shares for all other energy sources, such as natural gas, rose (Britton 1996, 140). Within both the capital goods and the consumer sectors, demand shifted toward more energy-efficient plants, machinery, and consumer products (Tsai 1989, 247).

Changes in Demand, Competition, Demographics, and Labor Unrest

In addition to supply-side shocks, such as the example of oil prices cited above, a variety of other market factors can also result in shocks to specific industries. For example, industries that face a decline in demand for their products or services may be forced to cut costs and reduce their labor force, and those that undergo a permanent decline in demand may eventually have to shut down operations.

Another explanation for shocks to industries is new domestic competition; consider drugstores in the United States, which have faced new competition from grocery stores and discounters such as Wal-Mart. Demographics also play a role in economic shocks; for example, the low rate of population growth in the United States has led to decreased demand and, hence, excess capacity in the food-processing industry (Mitchell and Mulherin 1996, 213).

Lastly, labor strikes can also cause upheaval in industries. By mid-July 1998, the General Motors strike in the United States had idled at least 15,000 workers in Canada, who were without auto parts (Little 1998). During the same period, prolonged strikes in the Toronto-area construction industry delayed large numbers of building projects (ibid.).

Corporate Mismanagement

Christie cites business authorities' general belief that, "although unforeseeable events and uncontrollable external forces do occasionally cause business failures...'management is the major cause of financial failure'" (1984, 107). In the cases we examine below, one cannot say that the particular events, such as an explosion in a mine, were unforeseeable natural events. Rather, they were the result of corporate mismanagement coupled with governmental negligence.

The Westray coal-mining project was expected to revamp the economy of Pictou County, Nova Scotia, generating 15 to 20 years of work for 200 local employees in addition to spinoff gains across Canada. Unfortunately, these prospects of economic growth disappeared in May 1992 when an explosion in the mine killed 26 men. The general area was known to be hazardous, and cave-ins had occurred during construction. Moreover, employees complained about the presence of coal dust and the occurrence of cave-ins, and up to ten days before the explosion, provincial inspectors had issued warnings and safety orders. The company in charge of the project, Curragh, was determined to meet production deadlines, and it ignored the warnings (Mollins 1993, 15). In 1997, the public inquiry into Westray concluded: "[T]he Westray managers, in a frenzied rush to produce coal, ignored basic safety provisions and allowed explosive levels of methane gas and coal dust to pile up in the mine" (Fotheringham 1997, 72). Under the direction of superiors, workers had tampered with the methanometers, so that the machines would continue to operate should methane levels rise above the approved level of 1.25 percent (Jobb 1994, 208). Although the prospects of economic benefit may have been short-lived, the tragedy that resulted was indeed a shock to the community and to workers who had moved to Pictou expecting steady work at the Westray mine. Hundreds were displaced, and some lost their homes and other assets (ibid., 300).

Another example comes from the nuclear industry, which many Americans supported until March 28, 1979, when an explosion and meltdown occurred in Pennsylvania's Three Mile Island nuclear reactor. Though surrounding areas were not damaged, many people fear that increased cancer levels among area residents are attributable to the accident. In addition, the shutdown of numerous nuclear plants and the lack of any further expansion in nuclear facilities since the Three Mile Island disaster have displaced many workers.

The causes of the Three Mile Island meltdown and of other nuclear plant closures echo the claims made with regard to the Westray disaster. Wasserman cites investigative reporters, such as Mark Dowie, Mark Hertsgaard, and Ashly Craddock, as he describes the nuclear "industry's priorities of profits first and safety a distant second" (1996, 18).

International Shocks

Globalization has profoundly transformed domestic economies and the international economy as a whole. International developments around the world now affect many domestic economies. An example discussed above is the oil crises of the 1970s.

Globalization and Interdependence

Due to the incorporation of nation-states into an interdependent, international economic system, Canada, like other countries, has become vulnerable to events elsewhere. A notable example was the Mexican peso crisis of 1995, almost two years after the North American Free Trade Agreement (NAFTA) took effect. Canadian exports to Mexico suffered as demand for the products declined. Other Canadian firms suffered economic losses; one was John Labatt Ltd., which, shortly before the crisis, had invested in a large beer producer in Mexico. In addition, numerous Canadian investors in Mexican stocks and bonds faced large losses (Willis 1995, 38–40).

More recently, the east Asian financial crisis had adverse effects on countries worldwide, including Canada. British Columbia was hit the hardest, as approximately 35 percent of the province's exports were destined for Asian markets, compared with 8 percent of Canada's exports as a whole (Thomas 1998, 4). In addition, the large drop in world commodity prices that stemmed from the crisis decreased the value of Canada's raw materials and primary manufactured goods.[3]

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[3] "Fighting the Asian flu," *Financial Post*, September 26, 1998, p. A8.

Shifts in Comparative Advantage

"A country has comparative advantage in a good if the product has a lower pretrade relative price than is found elsewhere in the world" (Husted and Melvin 1995, 64). *Comparative advantage* involves a "comparison of the structure of costs *among* various domestic products *as compared to* the structure of costs of these products in other countries," such as the costs of labor and capital inputs (Pearson and Salembier 1983, 7).

As discussed later, economic changes resulting from comparative advantage may be the proximate result of a government policy decision to liberalize trade with countries that have, for example, lower labor costs. The "relative pretrade price" of labor-intensive products is likely lower in those countries and, consequently, comparative advantage in the production of such goods exists there.

Once trade has been liberalized, shifts in comparative advantage can occur as a result of international and domestic factors. Foreign governments may decide to subsidize certain industries in order to make them more competitive — for example, by subsidizing research and development of new technology — and thereby gain a comparative advantage in those industries. In addition, other countries may adopt lax labor standards, ban unions and strikes, or generally have less demanding unions and less generous social welfare systems, giving them a comparative advantage in labor-intensive industries. As Rodrik notes, the decision of Hoover Europe, the subsidiary of the US company, to relocate its plant from France to Scotland in 1993 was "apparently motivated by the fact than unions in Scotland were ready to accept terms that were decidedly more flexible than those in France" (1997, 44). Foreign governments may also refrain from establishing or enforcing strict environmental regulations, resulting in cheaper production costs; however, Rodrik claims that "few studies...have concluded environmental regulations to be a significant determinant of competitiveness or comparative advantage" (ibid., 46).

Beyond international influences, countries that develop new technology may gain a comparative advantage in the relevant good or service or may lose comparative advantage in a sector owing to the enactment of tough labor and environmental standards. The loss of comparative advantage in a particular sector can produce losses and hardship. As Pearson and Salembier note, "[c]omparative advantage determines the direction and pattern of trade, and hence affects the structure of employment as among sectors" (1983, 11). Consequently, industries that lose comparative advantage may "stagnate or decline," resulting in a displacement of workers and economic and social harm to communities as a whole (ibid., 10).

Government Shocks

Government itself can create economic shocks. Sometimes it does so by instituting a change in policy or regulation and sometimes through mismanagement.

Trade Liberalization

Canada has taken an active part in trade liberalization policies as a member of the General Agreement on Trade and Tariffs (GATT) and the World Trade Organization. The first eight rounds of tariff negotiations under the GATT after World War II dramatically reduced world tariffs on average — from about 40 percent on manufactured goods in 1947 to less than 5 percent today (Trebilcock and Howse 1999, 123). Moreover, Canada has drastically reduced tariffs and nontariff barriers with its largest trading partner, the United States, under the 1989 Free Trade Agreement (FTA) and the 1994 NAFTA.

The Canadian economy has profited from larger markets and increased exports in, for example, the automobile industry. As Martin says, "[t]he strong expansion of Canadian exports in the last half of the 1980s, and into the 1990s, has contributed to increased employment within Canada" (1993, 8). Table 2 lists the top five goods industries and indirect services industries, as of 1991, in which exports were responsible for the most job support.

Table 2: ***Goods and Indirect Services Industries, Ranked by Number of Export-Supported Jobs, Canada, 1991***

Industrial Sector	Number of Jobs
Merchandise goods	
Agricultural and related services	171,176
Transportation equipment	144,827
Primary metal	85,195
Electrical and electronic products	81,929
Paper and allied products	76,283
Indirect services industries	
Retail trade	119,471
Wholesale trade	112,996
Transportation	108,296
Business services	68,694
Finance and real estate	40,361

Source: Martin 1993, 16–17.

In addition, the comparative advantage in services industries, such as banking, and value-added knowledge industries has benefited the United States and Canada, increasing the number of jobs in these sectors. Chisholm notes that the Bank of Montreal has established a retail and commercial presence in all three NAFTA countries; more broadly, Canadian exports of high value-added products such as telecommunications and office and precision equipment has grown in the past decade (1996, 14–18). On the other hand, the absence of comparative advantage has meant that other industries, primarily in the manufacturing sector, have suffered.

The Canadian Centre for Policy Alternatives estimates that, within five years of the removal of trade barriers with the United States under the FTA, 344,000 Canadian manufacturing jobs and hundreds of companies were lost to lower-wage states south of the border (Diebel 1996, 42). (However, some of the job losses took place in industries, such as automobles, that were little affected by the 1989 agreement.) During the same period, the appreciation of the Canadian dollar, owing to the Bank of Canada's tight monetary policy to stabilize prices and consequent high interest rates and exchange rates, also contributed to this upheaval. It is clear, however, that Canadian industries are facing increased foreign competition, not only from the United States but also from other parts of the world, such as Latin America (most importantly, Mexico under the NAFTA) and southeast Asia, where labor costs are much lower than those in Canada. Freer trade and a stronger dollar resulted in significant contraction and unemployment in parts of the Canadian manufacturing sector — for example, in clothing and textiles, footwear, plastics and rubber, steel, auto parts, and furniture (Trebilcock, Chandler, and Howse 1990, 51–53, 96; Britton 1996, 169; Cameron and Watkins 1993, 113, 140–144). In addition, Ontario has suffered the closure of foreign subsidiary plants since trade liberalization has reduced foreign firms' incentive to have subsidiaries within Canada (Britton 1996, 196). Exacerbating the sectoral troubles is the fact that a disproportionate number of the affected workers are poorly educated and unskilled, female, or immigrants — people who comprise a large percentage of those employed in labor-intensive industries. As Trebilcock notes, these workers are often hard to redeploy and thus may suffer from prolonged periods of unemployment (1998, 11).

Deregulation

Deregulation involves the removal of artificial constraints, such as limits on the size and number of existing firms, as well as fixed prices. The result is the entry of new firms and a reduction of profits for incumbents. In both the United States and Canada, deregulation in the air transport, rail, trucking, and telecommunications industries has significantly altered their structure. Deregulation in the trucking industry in the United States induced new entries and produced excess capacity and the need for consolidation (Mitchell and Mulherin 1996, 213–214). In Canada, the decision of the Canadian Radio-television and Telecommunications Commission to deregulate the long-distance telecommunications market in the early 1990s resulted in new competition that has "captured 20% to

25% of the market through substantial reductions in long distance rates" (Trebilcock 1999, 11).

Grimms and Windle (1998, 42) discuss how reduced company profitability, stemming from deregulation, has led to attempts in some industries to decrease costs by using fewer workers, lowering wages, or hiring a higher number of nonunionized workers. Talley and Schwartz-Miller (1998, 128) examine deregulation in the US rail industry, which resulted from the *Railroad Revitalization and Regulatory Reform Act of 1976* and the *Staggers Rail Act of 1980*. They conclude that the primary strategy for decreasing labor costs has been reducing the size of the work force. In 1975, the industry had 548,000 employees; by 1985, the number had fallen to 372,000, and by 1993 to 271,000. The US airline and trucking industries responded to increased competition by decreasing industry wages. For the airlines, premiums fell from 34.31 percent in 1979 to 26.11 percent in 1989; in the trucking industry, they fell from 44.26 percent to 23.90 percent (Card 1998, 365–366). Lastly, reports from the US telecommunications industry note a decline in employment security for union workers and a general decline in employment at AT&T (Hendricks 1998, 274, 367).

Privatization

Between 1983 and 1997, the Canadian federal government sold its interest in 31 Crown corporations and mixed enterprises, including Canadian National Railway, Petro-Canada, and Air Canada. These privatizations resulted in the displacement of former Crown employees, and their number declined from 186,442 in 1985 to 75,074 in 1997 (Trebilcock 1998, 30, 36).

Regulatory Takings

Individual and corporate economic losses are often the result of new or modified government regulations, such as tax changes, control of overfishing, production bans, labor relations legislation, zoning regulations, and so on (Kaplow 1986, 517; Samuels 1974, 116). For example, private landowners and investors may suffer economic loss if a zoning regulation restricts the use of land in a manner that decreases its value (Blume and Rubinfeld 1984, 583). As Newcombe notes, however, "it is unusual for government to explicitly compensate a property owner for significant reductions in property value resulting from many common types of regulatory changes, such as down-zoning" (1999, 1). Currently, Canadian law makes it difficult to demonstrate that one has suffered a *taking* by government that gives rise to compensation. For an episode to qualify as a taking, an individual or business has to lose most of the value of an asset and the government must, in turn, gain something (*Manitoba Fisheries Ltd. v The Queen*, 1978). The result is that a vast range of government regulatory acts produces private economic losses that remain uncompensated.

Despite Canada's more conservative "takings" rule, the US constitutional principles of "due process and the prohibition against 'takings' of private property without compensation and valid public purpose" may have infiltrated Canada as a result of the NAFTA. Article 1110 of the agreement provides that, if an investment has been directly or indirectly expropriated or subjected to measures tantamount to expropriation, the investors are entitled to sue before an international arbitral tribunal (Schneiderman 1996, 501). In 1996, there were fears that, should Parliament pass a bill calling for generic cigarette packaging, foreign cigarette manufacturers could claim that their trademarks were investments and the ruling would be "tantamount to expropriation," requiring compensation under the NAFTA. This debate became moot after *RJR-MacDonald Inc. v Canada* (1995), in which a ban on promotional tobacco advertising and unattributed mandatory health warnings were held to be unjustifiable restraints on freedom of expression (ibid.).

The use of NAFTA article 1110 re-emerged, however, in the case of Ethyl Corporation. In 1995, rather than using environmental regulation, Ottawa banned imports of and interprovincial trade in the fuel additive MMT (methylcyclopentadienyl manganese tricarbonyl), which is designed to boost octane in gasoline. Virginia-based Ethyl, the only company that produces MMT, claimed that the ban was a discriminatory act amounting to "a substantial interference with Ethyl Corporation's control and enjoyment of its investment in Ethyl Canada (the Canadian subsidiary)...[and] this interference is a measure tantamount to the expropriation of Ethyl Canada" (Weissman 1996, 7; 1998, 6). Federal lawyers warned the federal government that Ethyl would likely win the case. Hence, in July 1998, Ottawa agreed to rescind the ban, pay Ethyl $13 million, and issue a statement declaring MMT to be a safe substance. In return, Ethyl dropped its $250 million NAFTA suit. This case and a later one — *S.D. Meyers v Canada*, which involved a ban on PCB exports and led to a successful claim for compensation under article 1110 — resulted in much outrage among NAFTA critics concerned that domestic sovereignty and the ability to regulate matters of public policy have been severely undermined as international actors have become influential in the domestic decisionmaking process (Trebilcock 1999, 57).

Maladministration, Bureaucratic Negligence, and Regulatory Failure

Compensation for the negligence of public officials has been and continues to be a contentious issue. Cohen notes that, given the growth of the regulatory state, claims against governments have extended to claims for the recovery of economic losses related to maladministration, bureaucratic negligence, and regulatory failure, such as "negligent enforcement of building regulations, the negligent failure to resolve labour disputes in the federal civil service, [and] the negligent regulation of financial institutions." Nonetheless, damage claims remain a minute fraction (0.0001244 percent) of the federal government's total budgetary expenditures (D. Cohen 1992, 215, 217). The reason is that compensation is awarded only if negligence is proved with respect to a scheme that was designed to protect against financial loss or if the plaintiff was in an "individualized" relationship with a particular public official (*Brewer Bros v*

Canada 1990, 225, 233). In sum, Cohen (1992) claims that negligent regulatory activity continues to occur without any compensatory or deterrent mechanisms, and concludes that such mechanisms must be sought outside the legal system.

The fisheries is one area in which government mismanagement of the collective-action problem has entailed compensation to those harmed. University of British Columbia economist James Brander expresses concerns that Canada could follow a similar path to that of Easter Island, in the Pacific Ocean, which was once resource abundant and consequently rich in gross domestic product. Eventually, economic decline ensued as a result of the abuse of its resource base. Brander states: "[W]e are using our natural resources at a rate that is disturbing" (quoted in Nikiforuk 1997, 99).

In 1992, Atlantic fishermen were exposed to a severe economic shock as the cod fishery collapsed. About 40,000 people lost their jobs, 30,000 of them in Newfoundland, a devastating blow to an economy in which the cod fishery has been a mainstay (see Pollack 1995, 48–55). The depletion of the cod stocks has been partly attributed to an increase in the population of seals and colder water temperatures, but the factor that most parties blame is overfishing, and Fishery Products International (St. John's) and National Sea Products (Halifax) have become the corporate villains. Their high-tech trawler fleets, which were able to locate fish stocks electronically, towed large net bags along the bottom, effectively strip-mining the seabed of massive amounts of cod, clams, scallops, sea urchins, and other bottom-dwelling creatures (ibid.). Ottawa has also been targeted for having overestimated the cod fish stock and, therefore, subsidizing new boats and fish-processing plants and setting fishing quotas that, in effect, allowed companies to deplete the ocean at an excessive rate.[4] In addition, Ottawa was criticized for being slow to respond to the impending crisis and for intervening only when it was too late and cod fishing had to be stopped altogether (Blades 1995, 120).

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[4] "Leaving the Feeding Grounds," *The Economist*, August 17, 1993, p. 40; DeMont 1993a, 10.

More recently, the federal government acted to try to rescue the Pacific salmon, some stocks of which had reached near extinction in 1997. A conservation plan, announced in May 1998, entails a drastically reduced average of commercial, recreational, and aboriginal harvest levels for all Pacific salmon stocks. As a consequence, unemployment in the industry has risen, and communities in which the fishing industry is the heart of the economy have suffered. *The Gislason Review* reports that these communities are mainly remote regions of British Columbia that have few economic alternatives to aid their economy from the fallout.[5] In response, the federal government has allocated $400 million to help restructure the industry, retrain dislocated industry workers and assist them in finding new employment, and help communities diversify their economic base (Canada 1998a).

Troubles in the fishery are not unique to Canada. New Zealand orange roughy, Gulf of Mexico red snapper, and North Sea herring have also been virtually wiped out. The United Nations Food and Agriculture Organization estimates that approximately 70 percent of the world's fisheries have been commercially depleted.

Conclusion

Economic shocks come in a wide variety of forms. Our taxonomy categorizes them according to their source. The first group is shocks that result from natural phenomena — floods, earthquakes, hurricanes, and other "acts of God." These phenomena, while potentially devastating to human health, can also imply significant economic hardship for a region. When this hardship is acute and correlated across a large number of people, it fits within our definition of an economic shock. So, for example, a flood that destroys farmland over thousands of hectares in a region may constitute a shock, while a storm that fells a tree and destroys a shop does not.

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[5] *The Gislason Review: Fishing Communities in Transition*; available from Internet website: www.pac.dfo-mpo.gc.ca, accessed May 7, 1998, p. 5.

Another source of economic shock is the market itself. Included in this category is a wide range of market changes that affect a significant subset of the population. Domestic market shocks include changes in technology that create upheaval for a particular sector, variations in the costs of input (such as oil), and large shifts in demand. International market shocks include sharp changes in a domestic subeconomy's health because of economic change abroad. For example, the east Asian financial crisis strongly and adversely affected the BC economy. Shifts in comparative advantage may also affect a sector.

A final source of economic shock is government. A variety of government policies can adversely affect sectors of the economy. Trade liberalization opens sectors to foreign firms with which domestic firms may be unable to compete, creating hardship for workers and investors in those sectors. Deregulation, privatization, and the consequent introduction of competition may have similar effects. Government policies that impose new regulations (such as new environmental rules) may also adversely affect an economic sector. Finally, maladministration, such as has occurred in Canada's fisheries, can also create economic shocks.

This taxonomy is useful in assessing the normative basis for government intervention in the face of a shock. Depending on what type of shock has occurred, the case for intervention is stronger or weaker under a variety of normative rationales. To develop this relationship, one must first consider the particular normative rationales that are relevant to a consideration of public intervention in the face of shocks. We turn to such a consideration in the next chapter.

3 Rationales for Government Intervention

As discussed in Chapter 1, economic shocks can result in severe losses to individuals, businesses, and communities. Numerous normative rationales may either justify or militate against any form of government intervention designed to prevent or mitigate such losses. The rationales that are our focus here are economic efficiency, libertarianism, distributive justice, corrective justice, compensatory justice, and communitarianism.

Economic Efficiency

Analysts offer two important conceptions of economic efficiency. The allocation of social resources is *Pareto-efficient* (or Pareto-optimal) when it is "impossible to make one or more individuals better off without making someone else worse off" (Trebilcock et al. 1982, 4). In contrast, *Kaldor-Hicks efficiency* arises when society is, on net, better off from an economic change such that the winners from the change are in a position to compensate the losers "in the sense that the losers would be indifferent to the change after compensation and the gainers, even after paying compensation to the losers, would still derive a net benefit" (Tullock, quoted in Quinn and

Trebilcock 1982, 133). Compensation to losers could be financed from the gains of the winners or from taxpayers as a whole.

Pareto-efficient government intervention is rare because almost every policy negatively affects some person, violating the principle. Kaldor-Hicks efficiency, on the other hand, provides more scope for viewing intervention as efficient. In the present context, there may be Kaldor-Hicks efficiency reasons to intervene in the face of economic shocks. Since economists generally hold that *perfect markets* — those with full information and perfect competition — maximize wealth, market failure may evoke Kaldor-Hicks efficient intervention in the face of economic shocks. When these failures do not exist, intervention is likely to be inefficient because it will distort the market in a number of ways.

Government may have a policy preference for maximizing welfare either *ex ante* or *ex post*. Hammond notes that efficient *ex ante* allocations do not necessarily lead to *ex post* efficiency because individuals may base their decisions on misperceived probabilities of certain events, resulting in inefficient outcomes (1981, 235). Given that individuals often have to make decisions under uncertainty and are unlikely to assess all probabilities accurately, *ex ante* and *ex post* outcomes usually diverge, and policymakers wishing to intervene often have to make a choice between affecting *ex ante* or *ex post* allocations.

For example, in the case of investment in human capital, *ex ante* choices with respect to training and education may not be desirable on *ex post* grounds because individuals differ in their estimates of the probabilities of obtaining various income streams given certain educational investments. If government is concerned about the *ex post* utility of individuals and wishes to ameliorate their inequality of income, it can offer compensation, such as unemployment insurance. This subsidy is essentially a transfer from those who held correct beliefs to those who held wrong beliefs — that is, those who undertook training in the wrong occupation or no training at all and consequently have relatively lower income. Quite apart from equity considerations, such devices are a means of achieving *ex post* efficiency, on the grounds that society may wish to attain efficient allocations over realized, rather than expected, states of nature. On the other hand, if government is concerned only about *ex ante* utility, it should not offer *ex post* transfers because, by definition, they do not affect *ex ante* utility.

The choice between *ex ante* and *ex post* policy instruments can be a controversial one. Harris and Olewiler claim that adopting an *ex post* criterion implies that society does not respect individuals' beliefs and is thus a form of paternalism. However, as noted above, unless individuals accurately perceive the probabilities of various events, an *ex post* optimum cannot be achieved without some form of intervention on the part of government. If government is concerned about not wanting to appear paternalistic, policymakers may prefer to focus on making better information available *ex ante*, so that individuals can form more accurate beliefs, rather than on providing *ex post* compensation for individuals who are deemed to have held the "wrong" beliefs (Harris and Olewiler 1979, 145).

Natural Shocks

Many natural disasters evoke demands for government relief not only for humanitarian relief but also to offset the resulting economic shock. Two of the main arguments against the latter type of government relief programs are that they distort incentives and that the programs themselves may exacerbate the costs of a shock.

A contrary efficiency argument in support of government intervention is based on the claim that private insurance markets are imperfect with regard to coverage for natural disasters. Such a failure may lead to inefficiency because risk-averse indviduals may not be able to purchase private insurance.

In this section, we describe each of these arguments.

Incentives

Kaplow states that government compensation constitutes an externality that "shifts part of the long run cost of private investment to the government and thus distorts an otherwise efficient decisionmaking process" (1986, 531). With regard to natural disasters, he believes that an "efficient decision-making process" entails the need for potential investors in land or equipment in high-risk earthquake or flood zones to take into consideration the full costs and benefits in determining whether the investment is constructive — an important cost being the prospect that their investment may be destroyed or severely diminished (ibid., 529–531). Lewis and Nickerson claim that government compensation produces overinvestment in property and underexpenditure on self-insurance, which includes "measures designed to protect property from damage" (1989, 221), such as building solid structures.

In addition, many scholars advocate the use of the private insurance market as a substitute for government compensation. Kaplow states that, although disaster relief and insurance both spread the risk of loss, insurance is beneficial because it "would force investors to account for flood (and other natural disaster) risks by requiring them to pay in advance for expected losses" (1986, 550). Priest supports this view:

> The absence of pre-loss insurance premiums, by definition, reduces the magnitude of disaster losses and eliminates the price signal indicating the relative riskiness of locating on coasts, fault-lines or floodplains. It is entirely a feature of the government provision of disaster aid. (1996, 30.)

He demonstrates this distortion of incentives with empirical evidence drawn from two government studies of disaster assistance for agriculture after hurricane Andrew and the 1993 Mississippi floods. The studies documented "sustained and repeated losses from 'disasters', year after year in the same counties or states." Priest believes that the distortion of incentives is so extreme that people deliberately engage in risky activities in order to gain better returns as a result of government compensation. For example, a US Department of Agriculture report disclosed a significant increase in the production of vegetable crops even though there were no new markets for them (United States 1994a, 5; Priest 1996, 30–31).

Inefficient Government Programs

Priest asserts that the government studies he analyzes demonstrate that "the operation of government disaster assistance effectively increases, rather than reduces, the costs of natural disasters" (1986, 29). Inadequate regulatory discipline, bad management, and, on occasion, insurance fraud have contributed to the overcompensation of farmers for their losses. For example, one study shows that the US Agricultural Stabilization and Conservation Service compensated an orchard producer $51,000 for his crops lost to hurricane Andrew; the Agriculture Department later discovered, however, that the producer's "prior year gross income under normal growing conditions had been only $26,833" (United States 1994b; Priest 1986, 27). In addition, aid quantities were not adjusted to take account of cost savings from not having to harvest the crop or of cases in which producers had not taken sufficient care of their crops, reducing their prospective gross income (Priest 1986, 28–29).

Concerns about Private Insurance

Certain features of private insurance may lead to market failure and thus justify government aid in the face of economic shocks resulting from natural disasters. Kunreuther and Roth argue that market failures in the insurance industry are a result of ambiguity, correlated risk, adverse selection, and moral hazard (1998, intro., chap. 1–2).

Lack of Information. Two important conditions for the provision of insurance are "the ability, when providing different levels of coverage, to identify and quantify, or estimate, the chances of the event occurring and the extent of losses likely to be incurred" and "the ability to set premiums for each potential customer or class of customers." Uncertainty concerning such data "could cause insurers to refuse to supply coverage or charge very high prices for catastrophe insurance" (ibid., 12).

Correlated Risk. A crucial feature of insurance markets is risk aggregation, also known as *the law of large numbers*; it specifies that, "for a series of independent and identically distributed random variables (such as automobile insurance claims), the variance of the average amount of a claim payment decreases as the number of claims increases." However, *catastrophic risks*, such as those posed by earthquakes, floods, and hurricanes, are not independent variables; rather, the risks are highly correlated, meaning that numerous losses occur simultaneously from a single event (ibid., 24–25, 37). As Priest states, "[w]here risks are highly correlated, they *cannot* be efficiently reduced by spreading them among those subject to the risk" (1997, 8). The result is that "the risk to insurance companies, especially on introduction, can be simply too high to be considered as an acceptable business" (Thorne 1984, quoted in Albala-Bertrand 1993, 147).

Adverse Selection. "If the insurer sets a premium based on the average probability of a loss, using the entire population as a basis for this estimate, those at the highest risk of a certain hazard will be the most likely to purchase coverage for that hazard" (Kunreuther and Roth 1998, 34). This concept is known as *adverse selection.* The important assumption behind it is that purchasers of insurance know more about their risk type than do the providers. Consequently, "if insurers fail to correctly distinguish between risk types, for whatever reason, informed individuals in high-risk areas will be more inclined to purchase coverage, while those in less hazardous-prone areas will be disinclined to buy coverage, resulting in a skewing of the market and an unprofitable book of business for insurers," leading, at the limit, to the unraveling of private insurance markets (ibid., 1998, 12).

Moral Hazard. Another concern about insurance is the existence of *moral hazard*, which refers to the idea that the provision of insurance protection to an individual may induce that person to behave in a more careless manner than he or she would have before the purchase of coverage (ibid., 36). For example, individuals with coverage may be more likely to invest in disaster-prone land with the knowledge that they will be able to recoup the full amount of their investment should a disaster ensue.

Effects on the Insurance Market. As a result of the problems discussed above, "insurers may want to charge premiums that considerably exceed the expected losses," and the outcome may be a lack of demand for coverage and, in turn, a lack of provision (ibid., 38). In the United States, private coverage for disasters such as hail storms, winter storms, and wildfires is almost universal, as these types of disasters are widespread and random and, consequently, expected losses can be forecast with a reasonable amount of certainty. In contrast, the expected losses from hurricanes, which are infrequent and capable of causing enormous financial damage, are highly uncertain (ibid., 40–43). This problem of uncertainty, combined with the issue of correlated risk, has resulted in unprofitability in the insurance market, with the result that "some insurers have determined their potential risk of a catastrophic loss in Florida to be so great that they have withdrawn from the state entirely" (ibid., 106).

Floods are another natural disaster for which private insurance has proven unmarketable because of problems of adverse selection and high correlation. As a result, in 1968, the US Congress "created the National Flood Insurance Program...as a means of offering coverage on a nationwide basis through the cooperation of the federal government and the private insurance industry" (ibid., 40).

A final point of note is that property owners and investors often underestimate the likelihood of a natural disaster and its consequences and thus refrain from buying insurance. In addition, they may be unaware of the "availability and terms of insurance" (Albala-Bertrand 1993, 148). Lewis and Nickerson argue that government's appropriate role here should be the dissemination of information, provided that it has access to superior information concerning the probability of different natural disasters (1989, 218). This government role would respond to the lack of information that could lead to the suboptimal purchase of private insurance.

Market Shocks

As already noted, the sources of market shocks are many. We concentrate here on three of them: the depletion of natural resources, changes in technology, and sharp changes in the price of inputs.

The Depletion of Natural Resources

The production or consumption of certain goods may result in the spreading of benefits or costs beyond the producer or customer, a concept known as *externalities*. If these external benefits or costs are not internalized, the result is the underproduction and underconsumption or overproduction and overconsumption of such goods, respectively (Trebilcock 1998, 3). Haveman claims that "when significant spillovers are found in the real world, collective action, usually through a government becomes necessary if efficient performance is to be secured" (1973, 869–870). Efficient performance can be secured once externalities are internalized and the discrepancy between private cost and social cost is eliminated.

The "tragedy of the commons" is the phrase often used to denote overexploitation of common property due to the externalization of social costs. "If a productive resource is, indeed, made freely available for exploitation, then under certain conditions its exploitation may be carried to a level that imposes severe social costs" (Cornes and Sandler 1996, 59). An individual's gain from, for example, introducing another cow to graze on common land is distributed as a cost to himself *and* to all the others who use that commons. The individual does not internalize the total social cost, and the result is that "the Commons becomes severely overgrazed, and everybody loses" (Bering 1995, 74).

Gilbert documents that individual initiative was unproblematic so long as codfish were plentiful on the Grand Banks, "but when floating fish factories swarmed over them, overfishing diminished the stock available to all" (1991, 97). Situations such as this one lead historian Conrad Wright to claim that "the social situation that fostered individualism (a combination of population, natural resources and technology) will be a temporary one" as limits of growth become evident (quoted in ibid., 97). Solutions in Canada and worldwide have entailed the setting of fishing quotas and moratoriums on fishing to allow stocks to replenish. In Canada, the federal government has provided compensation packages to employees of the fisheries in the Atlantic provinces and on the Pacific coast in order to mitigate their losses from fishing moratoriums.

Changes in Technology

Newton et al. propose two efficiency rationales for the provision of compensatory programs geared toward the facilitation of labor market adjustment in the face of technological changes. On a macroeconomic level, they claim, the unevenness of the impact of technological change — the "[r]apid development in one [technology] industry or region — may give rise to inflationary bottlenecks at the very moment that labour displacements elsewhere are swelling the ranks of the unemployed," producing instability and inhibiting output growth. Labor adjustment programs and compensation could serve to reduce this instability. In addition, they state, "a less painful transition will enhance acceptance of the new (efficient) technologies" (1990, 236, 237).

Ghosh provides a description of the resistance that could result if the threats to labor are not mitigated:

> In the modern world, this unorganized negative response from labour (to technological innovation) often takes the form of wildcat strikes, walk-outs, tool-down strikes, etc. In India, the latter types of negative responses are well known.... The organized labour response to technological change — particularly that against rationalization, mechanization and automation — has led to work stoppages on several occasions....*The Times of India* strike (1984) at Bombay is a typical instance of this type of industrial dispute, in which, along with some other major factors, the workers' concern over the possible impact of technological change

> played [an] important role in the prolonged work-stoppage. (Quoted in National Productivity Council 1987, 14–15.)[1]

Providing some form of compensation may be desirable to moderate such worker resistance to technological innovation. Such mitigation often occurs at the level of the firm, not government, as it is in the interests of employers to have a cooperative and productive workforce. There is evidence that some firms have done well in allaying worker fears and protests. In a Canadian survey questionnaire distributed to unionized organizations and trade unions, some respondents noted that management had been "careful to introduce new technology slowly and in consultation with affected employees in order to avoid a negative fallout" (Wright 1991, 8).[2]

When companies do not have clear solutions for labor distress, government may play a role. In Canada, the federal government, through its Industrial Adjustment Service (IAS), provides public assistance for the "losers" of technological change. This service seeks to bring labor and management together in bilateral committees, which are then responsible for "working out a mutually acceptable assistance plan for workers faced with disruptive change," with the government acting as a facilitator and overseeing the plan's implementation. The IAS also provides funds for some of the committees' expenses and advice on available labor market options (Newton et al. 1990, 246–247).

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1 The National Productivity Council, established as a registered society in 1958 by the Indian government, is an autonomous, tripartite, nonprofit organization with equal representation from employers, workers' organizations, and government.

2 Such strategies have been successful in Japan, for example, where positive worker attitudes to technical change have been attributed to labor involvement in the decisionmaking process and to technology agreements providing for job security (Ghosh, quoted in National Productivity Council 1987, 18). In Canada, some employers are committed to employees' job security and have used transfers, attrition, early retirement, and generous buyout schemes in attempts to avoid layoffs (Wright 1991, 14).

Changes in the Prices of Inputs

Most economists believe that the free market generally maximizes efficiency. Thus, even in the midst of an economic shock such as the oil crises of 1973 and 1979, they argued that the market should be relied on to reallocate oil "from less valued uses to more valued uses by a bidding process in which those who have the greatest economic stake in the oil offer the highest prices,...[and to] restructure production so as to employ less oil and less energy-utilizing technologies" (Horwich and Weimer 1984, 32). Consequently, there is no strong efficiency rationale for government intervention.

Government intervention may, however, be supported as a result of the lack of private insurance against market risks, such as international price variability and shifts in comparative advantage. Cassing, Hillman, and Long (1986, 234, 241) and Eaton and Grossman (1985, 259) advocate the use of government trade policy, such as tariffs and import relief, as a substitute for insurance markets. On the other hand, Anthony suggests that market-risk management tools, such as forward, futures, and options contracts, be utilized as protection from commodity price variability; for example, in 1990 and 1991, Mexico bought put options, entailing the right to sell an asset at a pre-specified price at a future date, "in an effort to protect its revenues from crude oil exports" (1995, 211–212).

Government Shocks

Public choice theory provides an important framework for evaluating government action. It may explain government failures, meaning government policies and interventions that produce inefficient outcomes. The assumption behind the public choice model is that politicians' chief objective is one of self-interest — of maximizing their chances of election or re-election. As a result, they face incentives to confer benefits on "politically salient interest groups" (Trebilcock 1998, 8) and important voter groups, regardless of whether outcomes are economically efficient. For example, agricultural groups in North America and Japan receive subsidies and trade protection, although "most economists argue that agriculture is far too large in many industrialized countries" (Johansson 1991, 84).

Other situations, such as changes in government regulation and regulatory takings, draw arguments both for and against government attempts to offset economic shocks.

Arguments against Compensation

In an argument similar to that made against compensation for natural disasters, Kaplow asserts that "[i]t is socially desirable for investors to take into account the prospects for government reform" in order to make efficient decisions. Again, he argues that government compensation "encourage[s] overinvestment in activities that might be adversely affected by future government action" (1986, 531, 569). An example is the excessive and inefficient development of land by an owner who faces a known risk that a change in land-use regulations could decrease the value of the property (Lewinsohn-Zamir 1996, 62).

Levmore suggests another reason for noncompensation. Assuming that new legal rules are efficient, compensation should be denied on the basis that its lack creates an incentive for potential losers to use information opportunities to anticipate change and consequently to act in a manner that promotes the social interest (1999, 2, 6). For example, manufacturers who do not expect any compensation for the costs of regulatory change, such as the banning of certain hazardous substances, are more inclined to develop and adopt substitutes for chemicals they have reason to believe will be banned in the future. Consequently, "good change may in this way come about long before nominal lawmakers know to change the law" (ibid., 1999, 2).

Arguments for Compensation

Changes in government regulations and policies often result in losses to an individual or a group of individuals. Some law and economics scholars assert that government should be required to pay compensation to "losers" because policymakers would then internalize these costs in their decisionmaking. Some classify this concept as the alleviation of "fiscal illusion": if government had to compensate losers, government decisionmakers would give full weight to the costs of their actions (Kaplow 1986, 567). Lewinsohn-Zamir, in her writings on takings, asserts that government compensation is the best method of assuring efficiency because a new policy will be introduced only where a full cost-benefit analysis demonstrates efficiency gains (1996, 65). Tullock notes that, "from an efficiency perspective, by requiring that losers be compensated, we ensure that a regulatory change will go forward only if the total of its benefits exceeds the total of its injuries; such a change would increase social welfare" (quoted in Quinn and Trebilcock 1982, 119). Hettich and Winer also argue that the internalization of compensation would result in fewer inefficient policies and less deadweight loss because legislatures would be less prone to support public projects or programs that benefit special interests at public expense (1995, 349–350).

Some scholars maintain that when special interest groups attempt to block desirable policy changes, society would benefit overall from compensating these groups for any losses stemming from the change. Although Levmore is an advocate of noncompensation, he recognizes the implications of the public choice model and accepts the idea that, when new losers have the potential to block change, it may be necessary for government to use compensation to prevent their delaying the enactment of efficient new policies (1999, 7–8). For example, advancing a policy of trade liberalization may require offering compensation to the losing groups in order to avert their lobbying against the policy. Such a compensation scheme has been set up under the US Trade Adjustment Assistance Program. The program provides aid to workers in industries that have suffered unemployment or underemployment due to an increase in foreign imports from trade liberalization. Assistance has been given to workers in industries — such as textiles, apparel, and footwear — that have lost their comparative advantage (Quinn and Trebilcock 1982, 136–37).

Elections have at times been based on the issue of free trade. The 1988 Canadian federal election was fought largely over free trade. The North American Free Trade Agreement (NAFTA) was a key issue in the 1992 US presidential election, after which labor and environmental groups, among others, continued to lobby the new administration against ratifying the agreement. Before finalizing it, President Bill Clinton promised labor standards and environmental agreements with Mexico (see Destler, quoted in Collins 1998, 400; Trebilcock and Howse 1999, ch. 15 and 16). One can see these proposals as attempts to secure ratification of the NAFTA by compensating the groups that were likely to lose as a result of the agreement.

Levmore observes as well that groups differ in their ability to anticipate government change. For example, while a manufacturer may have an informational advantage concerning safe production methods and possible future legal bans, a property owner is unlikely to have an advantage about such things as where the government is going to build a road. Thus, there may be justification for noncompensation in the former case and compensation in the latter (1999, 18). Lewinsohn-Zamir also acknowledges that, when the risk of damage to the property values is unknown or low, "a rule for compensation will not distort investment incentives because this risk can hardly be taken into consideration" (1996, 63).

Finally, a strong argument for compensation is the need to protect private property in order to ensure the efficient use of resources and optimal investment in land. If investors and landowners fear that government may "forcibly take the fruits of such investment" without compensation, they will likely underinvest (Lewinsohn-Zamir 1996, 64).[3]

Blume and Rubinfeld argue that government compensation for regulatory takings may be desirable because investors cannot use the private insurance market to protect themselves from the risks associated with regulatory change (1984, 572). Lewinsohn-Zamir attributes this market failure largely to problems of information and adverse selection. She claims it is difficult for insurance companies to set premiums because they are unlikely to be able to assess the probabilities of regulatory takings accurately. Thus, they face an adverse-selection problem and lose money because their customers could be people whose probability of injury is higher than average, requiring payouts that are greater than expected (1996, 67). This problem arises, according to Blume and Rubinfeld, because "insurers are not always as accurate as policy holders in assessing the probabilities of the events they are insuring" (1984, 535). In land markets, they argue:

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[3] Note that this argument is directly contrary to the overinvestment argument described earlier.

> Risk-averse individuals who perceive that they are likely to be negatively affected by a zoning change will purchase insurance. Those who are not risk averse and who do not perceive this likelihood will not buy insurance. However, the insurance company might be unable to distinguish among these purchases and, therefore, it will be unable to set the appropriate premium for its policies. (Ibid., 536.)

Blume and Rubinfeld also cite the problem of moral hazard, whereby private investors in land are less likely to lobby against government policies that lower property values once insured. All these factors may account for the lack of private markets for insurance against changes in the value of land resulting from government regulatory changes (ibid., 537, 594).

Kaplow, a strong supporter of market mechanisms, acknowledges the difficulties with private insurance markets and states "it is more plausible that the government would be in a better position than the market to counteract adverse selection or other informational problems" (1986, 545). In addition, he notes that, as a result of the low probability of government expropriation, "the administration costs of arranging private insurance may impede the establishment of an efficient insurance market for expropriation" (paraphrased in Newcombe 1999, 24).

Libertarianism: Individual Autonomy

Classic liberal or individualist political philosophers such as Thomas Hobbes, John Locke, and John Stuart Mill, and libertarians such as Friedrich Hayek and Milton Friedman emphasize individual autonomy, the inviolability of individual rights, and an anti-perfectionist view of the state (see Watson et al. 1999; Barr 1998). Individuals are autonomous agents who are self governing, with "the ability...to determine for himself or herself a view of the good life" (Taylor 1992, quoted in Singh 1997, 170). Personal autonomy is seen as essential to human dignity. Consequently, the role of government should be minimal. "From a Kantian perspective, a central rationale for the state is to provide for the co-existence of the freedom of each with the freedom of all, through coercive laws that prevent interference by individuals with the rights of other individuals to property and bodily integrity" (Trebilcock 1998, 6). The minimal scope of government thus includes the preservation of law and order, the enforcement of private contracts, the establishment and protection of property rights, and the fostering of competitive markets (Barr 1998, 47; Wagner 1995; Johansson 1991, 71).

These philosophies have various implications for different kinds of economic shocks.

Natural Shocks

The belief in minimal state interference and strong faith in the functioning of markets leads most libertarians to reject compensation for natural shocks. Individuals choose to live in certain areas, and those who decide to live, for example, on the banks of flood-prone rivers or in earthquake zones have assumed the risk that they will suffer losses from such natural disasters. It is up to these individuals to limit this risk — for example, through structural mitigation, such as the building of dams — or to purchase private insurance, rather than rely on the state for assistance. The only assistance that is acceptable is private charity.

Market Shocks

Libertarians believe that competitive markets maximize freedom and hence strongly advocate free market mechanisms (Schmid 1987, 242). Bering (1995), a libertarian writer, argues against any form of trade protectionism or state subsidies for domestic industries because they result in inefficient overemployment and reduce incentives to improve production methods and technology. Unlike the proponents of economic efficiency and public choice models, who argue that compensation may be desirable to "bribe" the losers into accepting economic change, libertarians do not advocate compensation for the losses stemming from free markets and trade. Other domestic market shocks should also remain uncompensated. For example, Samuels discusses the high value placed on consumers' tastes and changes in demand in the United States; consumers are sovereign and are not required to bear any of the costs that loser industries face, as a result of shifts in demand (1974, 130). With regard to technological change, Anderson and Schenk give a largely libertarian reason for why the US government has generally not intervened: "employment practices have long been considered as part of the private business domain and to open these up to the public domain and public scrutiny would take away the power of companies to hire whomever they please whenever they please" (1995, 20).

Libertarians may, however, support compensation for shocks caused by corporate mismanagement. As already stated, they believe liberty should be limited only to avoid interfering with other individuals' rights to property, human dignity, and bodily integrity. John Stuart Mill, a philosophical individualist, argued for extensive individual freedom consistent only with avoiding harm to others (Brittan 1998). The importance that libertarians place on avoiding harm to other individuals could support an argument for compensation in corporate mismanagement cases, such as those of the Westray mine and Three Mile Island nuclear reactor. Although one could also argue that the lack of proper safety measures was a result of trying to increase production and wealth in the market, such liberty and individual rights are, as noted, subject to avoiding harm to others.[4]

Government Shocks

As noted, libertarians do not support compensation for losses arising from the functioning of the free market or from natural shocks (if they could be covered by purchasing insurance in the free market). The converse of this argument is that libertarians are strong advocates of compensation in cases where government actions result in the "forced move [of private parties] away from the status quo" (Levmore 1991, 1333, n2).

Samuels argues that John Locke's ideal role of government and law was as protector of property rights; thus, "[i]n the Lockean context, the purpose of compensation is to protect the ownership, enjoyment, and status quo economic value of those property rights (1974, 114). Epstein, a libertarian scholar, holds the view that "*[a]ll* regulations, *all* taxes, and *all* modifications of liability rules (no matter how small the alteration) are takings of private property prima facie compensable by the state," subject to a legitimate public purpose, such as the protection of health and safety (1985, 57, 85, 95). Hence, regulations on land use or disposal of private property — for example, price restrictions — are acts that bring the government within the scope of the US "eminent domain clause" (ibid. 1985, 102).

Nozick supports the notion of compensation for taxation, as he believes that "taxation of earnings from labor is on a par with forced labor. One's holdings are an extension of the self, and to interfere with them is to violate individuals" (quoted in Gilbert 1991, 46). Of course, the purpose of taxation, whether it be to raise revenue or redistribute income, is defeated if compensation is required (see Kaplow 1986, 519). This result is consistent with libertarianism, which decries policies of distributive justice. As Arthur and Shaw note, the primacy of liberty, rights, and autonomy in libertarianism is "compatible with the existence of very great inequality" (1991, 114).

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[4] It is important to note, however, that many scholars criticize this "harm principle" because, without clearer specification of what "harm" entails, "the harm principle may be taken to invite state interference without limits, for virtually every kind of human conduct can affect the interests of others for better and worse to some degree, and thus would properly be the state's business" (Feinberg, quoted in Trebilcock 1993, 61).

Distributive Justice

The market system, even when operating efficiently, is often criticized for generating inequality in societies in the form of disparities in wealth and wide fluctuations in income in certain sectors.

Proponents of greater equity support government initiatives to use taxes and transfers for redistributing endowments across individuals "in order to attain a (in some sense) fairer distribution," by reducing disparities in income and wealth (Johansson 1991, 71). Many societies see distributive justice as entailing the provision of publicly funded services, such as health care and education.

Within the realm of distributive justice are two prominent perspectives: utilitarianism and Rawlsian distributive justice. Understanding what each prescribes is helpful to our discussion because the two sets of proponents agree on some but not all potential justifications for government action in the face of an economic shock.

Utilitarianism

Utilitarianism is a consequentialist theory that advocates the distribution of goods and services in a manner that maximizes the aggregate utility, welfare, or happiness of individual members of a society by maximizing net gains and minimizing net losses (Munzer 1991, 205; see also Glannon 1995, 432). *Utility* is defined as "pleasure, satisfaction, happiness, or the satisfaction of preferences, as the latter is revealed through individuals' choices" (Buchanan 1985, 55). This utility function may include both *efficient* allocation and *equitable* distribution (Arthur and Shaw 1991, 114).

Although utilitarians focus on efficiency or the total wealth in society, many offer rationales for government intervention that effectively redistributes wealth among members of society. First, some scholars, such as Alfred Marshall ([1920] 1982, 80–81), have argued that social utility will increase from a more equitable redistribution of wealth because, "even when outcomes are Pareto Optimal, redistributing some wealth and income from the better off to the worse off would increase the utility of the worse off more than it would decrease the utility of the better off" (Buchanan 1985, 55). Hovenkamp extends this view to the government provision of certain goods and services to those in need, reasoning that the utility of even limited amounts of food, subsidized housing, public education, and health care is high for individuals who are less well off (1990, 113).[5]

A second utilitarian rationale for redistribution is that it increases utility not only for the less well off but also for those who are better off, or, at minimum, it does not produce disutilities. Hovenkamp states that better-off, utility-maximizing voters may support higher taxes to care for the poor if that is the kind of society in which they wish to live (1990, 100; see also Trebilcock et al. 1982, 4). Myles notes that the losers of redistributive policies may genuinely be empathetic to the suffering of others (1996, 18). Trebilcock et al. give a final reason: that the losers may gain greater satisfaction from living in a more egalitarian society, which they believe to be less prone to revolutionary uprisings (1982, 4).

The Rawlsian Perspective

The Rawlsian perspective focuses on two different principles of justice: the liberty principle and the difference principle. The *liber-*

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[5] Note, however, that the assumptions underlying this perspective are highly contested, the assumptions being that interpersonal comparisons of utility are possible, that diminishing marginal utility exists for everyone, and moreover, the belief that "the threshold at which marginal utility begins to decline and...the rate of its decline are the same for all" (Buchanan 1985, 56).

ty principle prescribes that "each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others" (Mulhall and Swift 1996, 7). The *difference principle* states that distributive justice warrants policies that benefit the least advantaged, socially and economically (see ibid.; Rawls 1971).

The difference principle is somewhat like the utilitarian argument for the redistribution of goods and services in favor of the less well off. Indeed, Glannon adds that "[i]n benefitting the worst off, we thereby promote conditions for a stable, well-ordered society from which everyone will benefit" (1995, 430). Again, this argument seems to resonate with the utilitarian rationale that the better off may derive utility from living in a stable society.

Glannon goes on, however, to state that the absolute reading of the difference principle "says that we should help the worse off... regardless of the magnitude of losses to other better-off social groups" (ibid. 435–436). This is where utilitarianism and the Rawlsian perspective significantly diverge. A policy that increases total social welfare may be regarded as just under a utilitarian perspective but unjust under a Rawlsian perspective if it does not advance the status of the least advantaged (see Barr 1998, 48–52; Trebilcock 1998, 6). In other words, utilitarianism is concerned with aggregative principles, whereas Rawlsian justice is concerned only with distributive and comparative considerations (see Glannon 1995, 427). An aggregate cost-benefit analysis may result in the determination that "the claims of the least advantaged to receive benefits... [are] outweighed by the claims of the more advantaged to not incur loss" and consequently provide a utilitarian argument against redistribution, contrary to Rawlsian justice (ibid., 428).

In addition, Glannon notes that a group that is better off than the worst off may fall on or just above the sufficiency baseline. Under Rawlsian justice, they would not be favored in redistribution policies as they are not the least advantaged. Yet any economic loss to the group — for example, through a redistribution in favor of the least advantaged — may force its members below the baseline (ibid., 434). Losses to this group would signal a significant drop in welfare, which would be recognized under utilitarianism but not necessarily under Rawlsian justice.

Natural Shocks

Government disaster relief often benefits a disadvantaged group, the poor. As Le Grand notes, the poor are often uninsured (1991, 121) and do not have the resources to cover losses suffered from a natural shock. If the least well off are harmed by a natural disaster, the Rawlsian rationale may support such a policy of relief. Whether the utilitarian perspective would too is unclear.

The answer may depend on the costs of the redistribution scheme to other members of society. Redistribution policies may not be justified under a utilitarian perspective because the better off also often suffer devastating losses from natural disasters. The disutilities they face as a result may be exacerbated by a policy of redistribution whereby they must compensate the worst off. In such a situation, it is unclear whether the net gains would exceed the net losses from a compensation policy in favor of the least well off. On the other hand, the utilitarian rationale may justify compensation to individuals other than the least advantaged who suffer drastic losses from natural disasters since the resulting increase in the utility of compensated individuals could produce an aggregate increase in social welfare.

Market Shocks

For numerous cases of market shocks, compensation can be justified by invoking either the utilitarian or the Rawlsian rationale. For example, both technological changes and changes in comparative advantage produce winners and losers; the segments of the population that are more adversely affected than others tend to be those that are already less well off. "Technological change is reinforcing the long term shift toward white collar occupations and the growth of professional and technical employment, relative to blue collar and low skill jobs" (Riche 1990, 272). As a result of a lack of skills and education, these latter workers "are unable...to take advantage of the employment opportunities created by the new technologies" (Newton et al. 1990, 236).

According to the utilitarian argument, since the individuals who suffer from unemployment are those who were already less well off in terms of income and wealth, the assumption of diminishing marginal utility leads to the conclusion that a decrease in their income produces greater disutility than any increase in utility that the better off face from new job opportunities and possible higher wages. The net result is a decline in social welfare, providing a rationale for compensation to the losers of such economic shocks. Some commentators go as far as to advocate the establishment of a guaranteed annual income program to lessen the disutilities suffered by "the working poor" (Lerner 1990, 257).

Another rationale in support of compensation to workers who suffer displacement due to technological change is that the better off may derive utility from the knowledge that labor strikes will be less likely, thereby reducing the possibility of civil unrest and ensuring that work stoppages will not hinder the provision of goods and services.

All these policies may also be justified under a Rawlsian perspective if they aid the least advantaged.

Another possible area of intervention is in cases of price shocks. The free market often produces sharp income fluctuations in certain sectors, affecting the standard of living of those vulnerable to the changes. These vulnerable groups may be considered disadvantaged, and thus policies that serve to stabilize their incomes could be justified under distributive justice. Examples include the agricultural and other natural commodity industries that are vulnerable to changes in world commodity prices.

The oil crises of 1973 and 1979 provide a related example. Horwich and Weimer, who believe strongly in the free market, nonetheless note that a relatively small number of consumers have both very low incomes and great difficulty in reducing their short-run consumption of energy products because they need to avoid health risks for small children, the elderly, and the sick; oil price shocks cause these people real hardship unless they are provided with financial assistance (1984, 141).

Utilitarian arguments here may militate against the adoption of such policies. As in the case of natural disasters, people who are better off may also suffer grave losses during a price shock. Any additional decline in their wealth, caused by a redistributive policy in favor of the very least advantaged, may produce serious disutilities that could overwhelm the increase in utility derived from the policy; consequently, aggregate social welfare could decline.

Government Shocks

The decision on whether to compensate for regulatory takings can be analyzed under a utilitarian perspective. Michelman's formula for answering this question is composed of:

- *Demoralization costs (D)* — the disutilities to uncompensated losers and their sympathizers, and the lost future production from impaired incentives or social unrest that would arise if no compensation were paid,
- *Settlement costs (S)* — the costs, chiefly the administrative costs of operating a compensation program, that must be borne to avoid demoralization costs, and
- *Efficiency gains (E)* — the excess of the gains produced by a government action over the losses inflicted by it, not including D or S.[6]

Government should compensate if demoralization costs exceed settlement costs — that is, if $E > D > S$ or $D > E > S$. On the other hand, government should not compensate if settlement costs exceed demoralization costs (Munzer 1991, 205–206). Utilitarianism is concerned here largely with the aggregate welfare effects of a taking, whereas Rawlsian justice is concerned again with the protection of the least advantaged.

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[6] Michelman, as explained in Munzer (1991, 205). Munzer himself claims that Michelman's use of the term "efficiency gains" is somewhat misleading because it includes interpersonal comparisons of gains and losses, which is a feature of utility; hence, the term "utility gains" would be more accurate.

Under a distributive justice perspective, government should compensate minority groups that are the least able to protect themselves from regulatory takings. *Minorities* here refers to minorities in the political process, "unprotected individuals or groups that do not regularly participate in political bargaining" (Levmore 1990, 311) because they do not have the numbers, the time and resources, or the political influence — for example, the poor. On the other hand, organized interest groups are deemed to be protected from losses because of their ability to penetrate and affect the political process (ibid., 306). Quinn and Trebilcock claim that "individuals or groups who suffer losses at the hands of stable winning coalitions are...less likely to derive offsetting benefits from the public choice process and may therefore be preferred candidates for compensation on ethical grounds" (1982, 123).

Levmore suggests that unprotected minorities who lack political influence are particularly sensitive to changes in government policy, such as deregulation and, moreover, takings law. For example, he states that price or wage controls directed at one business, rather than an entire industry or the economy as a whole, are more likely to entail compensation because a single business is more helpless politically (1990, 312–313; see also idem 1991, 1347). In contrast, he notes the refusal to classify taxes levied on corporate revenues, property owners, cigarettes, retail taxes, and so on as takings that require compensation, because the numerous persons and groups affected are organized interests, and thus garner protection in the political process (1990, 308). In sum, Levmore concludes that the "takings clause may have evolved as a means of protecting individual citizens or unprotected minorities from adverse political decisions" (1991, 1348).

This argument can be extended as a rationale for compensation in areas other than takings law. For example, small businesses often suffer great losses in the event of a natural disaster; however, they may have less political influence than larger businesses. Thus, compensation to small businesses — in the form of cheap loans as currently provided in the United States through the US Small Business Administration Disaster Loan Program (Dacy and Kunreuther 1969, 134, 186) — may be justified on the grounds that they are generally less well protected in the political realm.

Corrective Justice

Corrective justice, as described by Weinrib, is a quantitative equality in which "one person's gain necessarily entails another's loss, so the doing of injury by one entails the suffering of injury by another" (1995, 65). The premise here is that all individuals are juridical equals and ends in themselves, whom others cannot treat as mere means or instruments to their purposes and desires. On this view, breach of contract or tortious injury constitutes one individual's interference with the rights of another, creating an inequality in the relation between the doer of the wrong and the sufferer; it can be corrected or rectified by the doer's returning to the sufferer the value of what has been taken, thereby re-establishing the initial equality between the two. This initial equality is not defined in terms of equality of resources or status, but by the equal right to noninterference with one's person and property (ibid.).

Corrective justice serves as a rationale for compensation in negligence law, within both the private and public sectors. Weinrib discusses how this law has developed, incorporating the views of corrective justice; the focus is on risk in the duty to take reasonable care, and the causal connection between risk and injury is a "relational concept that connects doing and suffering" (1995, 147, 153). In private law, compensation is extracted from the private doer and often does not involve government. In cases of public negligence and maladministration, however, corrective justice may support government's (the doer's) paying compensation to the sufferer.

Examples include compensation for the negligence of public officials in cases such as the Westray tragedy (although that case has largely been dealt with as one of corporate mismanagement). Another possible example is the case of the fisheries. It is unclear whether corrective justice can explain the government compensation programs that have been established in this sector. Government negligence in setting excessive fishing quotas would have to be linked to the current suffering of the unemployed fisheries workers.

An additional relevant area involving government is takings law — specifically, physical takings. Levmore suggests compensation is required when government intervention is seen as a substitute for private purchase. Hence, when a government tears down a private home in order to build a public office building or a school, compensation is likely necessary because a private party, in a parallel situation, would have had to purchase the right to act in that way (1991, 1340). This compensation can be justified under corrective justice: the initial equality between the doer (the government) and the sufferer (the private homeowner) is restored through rectification, whereby the doer returns to the sufferer the value of what has been taken.

Note, however, that, in order to qualify for rectification, the entity that alleges a taking must have possessed a property right to engage in the activity in question. Sometimes the law that has previously recognized the "supposed property rights of employers to maintain an unsafe workplace, or landlords to rent uninhabitable and unsafe housing, and of individual producers to pollute air and water" later determines these acts to be wrong. Such property rights are then deemed invalid (Radin 1991, 253). In such cases, Radin argues, government regulation to prevent unsafe workplaces, uninhabitable housing, and pollution are really actions of corrective justice with regard to those who suffered under the old legal recognitions and, consequently, are not takings from the new losers requiring compensation (ibid., 251).

Compensatory Justice

Compensatory justice, as defined by James W. Nickel,

> [r]equires that counterbalancing benefits be provided to those individuals who have been wrongfully injured which will serve

> to bring them up to the level of wealth and welfare that they would now have if they had not been disadvantaged. Compensatory programs differ from redistributive programs mainly in regard to their concern for the past. (Cited in Paul 1991, 103.)

Compensatory justice also differs from corrective justice in that the idea of bringing individuals back "up to the level of wealth and welfare they would now have if they had not been disadvantaged" is a more expansive view of compensation than the corrective justice notion of restoring the victim to the condition that he was in before the unjust act (Paul 1991, 103). In addition, compensatory justice is also concerned with problems of collective action, in which a large number of individuals who have all been wronged are unable to come together and press for compensation. Levmore notes that "collective action problems among claimants may be overcome as the time to press claims grows short or even as the number of surviving victims shrinks" (1999, 33). Voluntary government compensation is the solution advocated under the compensatory justice framework.

Such compensation has limits, however. For example, with regard to compensation to racial minorities for past discrimination, US Supreme Court Justice Scalia states that governments can be allowed to take race into account in government programs and policies only if they are attempting to rectify a past violation of the equal protection principle that they themselves, as opposed to private actors, committed (cited in Paul 1991, 113). Hence, in the 1989 US case *City of Richmond v Croson*, a remedial program that benefited minority contractors was struck down as no one could demonstrate that the local government itself had violated the rights of these minority contractors in the past (ibid., 107–111).

Examples of compensatory programs include the reparations, announced in 1988, by the US government to its citizens and permanent residents of Japanese ancestry who were sent to camps during World War II and the reparations agreement of 1952 in which the Federal Republic of Germany agreed to make payments to living Jewish victims of Nazi concentration camps (Paul 1991, 122–123). It has been argued that these programs have been successful because they are directed at identifiable, living victims and the suffering they endured was the direct consequence of government acts. Levmore says that reparations are triggered more by regret about the operations of the legal system than by more general societal and cultural norms (1999, 33).

Compensatory justice provides a rationale for governments to compensate for socioeconomic shocks from the past. Radin says government may wish to provide compensation for Indian land claims, even though the takings occurred long ago (1991, 255). In addition, government may choose to make payments to uncompensated victims of past government negligence.

Communitarianism

Unlike individualists, *communitarians* see the individual as incomplete and unintelligible outside his or her social relationships and social context; in other words, an individual's identity and life decisions are determined largely by community and group membership (Brittan 1998; Loewy 1991, 55). The notion of citizenship is fundamental; individuals have social responsibilities and obligations to enhance the good of society, duties that connect the individual with communal ethics.

Gilbert explains that communitarians strongly believe that every community must provide for the basic and essential requirements of its members as a recognition of need and of membership in the community; in other words, beneficence involves a sense of community (1991, 49, 125; see also Loewy 1991, 70). Like proponents of distributive justice, communitarians emphasize outcomes such as equity and economic security. The two outlooks differ, however, in that outcomes are important to communitarians not because equality is an end in itself but because it is a means of achieving social solidarity. Many of them believe that the greater the equality in income and wealth in a community and the fewer the number of underutilized workers (due to lack of education or economic recession), the stronger the sense of solidarity (Gilbert 1991, 55; Loewy 1991, 94). Weale notes, "[t]he immediate occasion for the development of welfare states was not a concern with equality but, rather, with...social solidarity" whereby the state insures its citizens against a range of common misfortunes or contingencies. Advocates of social solidarity point out that "the treatment of people in respect of these frailties [such as sickness and old age] should be in terms of their common humanity rather than their differences of status" (1990, 477, 478).

This principle of universality in the distribution of services, such as health care, regardless of status is a departure from the rationale of distributive justice since the recipients include the wealthy. Although proponents of distributive justice and efficiency argue for more means-tested programs, targeted solely at helping the poor, advocates of communitarianism continue to support universality in the provision of services such as education, training, and health care as a means of promoting social solidarity.

Also, communitarianism adopts a more moral tone than distributive justice; the individualistic pursuit of self-interest is deemed wrong not only because it produces inequalities but also because "it encourages selfish individual behaviour that in turn undermines the existence of strong and healthy communities" (Coughin 1996, 136; see also Gilbert 1991, 98; Watson et al. 1999; Wagner 1995).

A communitarian philosophy implies a need for government to intervene to protect the economic, social, and cultural needs of citizens and communities as a whole. Thus, it can serve as a rationale for extensive economic intervention by government. Some communitarians advocate state action "to ensure an ethically healthy rather than degenerate community" (Mulhall and Swift 1996, 295). Such a community would involve caring members of society who seek to help fellow community members, such as those who live in poverty and require basic needs, to provide public education such that every member of the community can develop skills and contribute to society and to provide aid to fellow citizens who suffer losses from various economic shocks, regardless of socioeconomic status.

Natural Shocks

From the communitarian's point of view, natural disasters that devastate communities entail obligations on the part of all community members to help rebuild and to compensate those who have suffered, regardless of status.

Market Shocks

Market shocks that displace workers and hurt segments of the community require compensation or assistance to those suffering losses in order to promote community solidarity and fairness. Communitarians support the notion that the community must benefit as a whole and be burdened as a whole (see Kaplow 1986, 578). Shifts in comparative advantage and technological change have produced both winners (technology and knowledge industries) and losers (labor-intensive industries) in North America (see Riche 1990, 272). One can argue that fairness requires a more even distribution of benefits and burdens. For example, Newton et al. state that, with regard to technological change, "sound policy prescriptions will ensure that just a few do not bear the brunt of the change and that all individuals be properly trained to share the fruits of technological progress" (1990, 236).

Government Shocks

As noted above, fairness and community solidarity entail sharing both the burden and benefits of government policies and economic changes. This notion differs from Rawlsian distributive justice rationales because the burdens placed on the least well off *and* on the better off should be shared. Quinn and Trebilcock discuss the view that, in order to "ensure that the sacrifice is widely shared," compensation should be provided for regulatory reforms that serve the public interest at the expense of some individuals (1982, 119). In the past, some communitarians have proposed taxing large winners, as in the cases of oil and gas price deregulation (Kaplow 1986, 555).

With regard to cultural and economic protection, Trebilcock asserts that "communitarianism often is invoked as a rationale for protecting the identity (cultural, linguistic, etc.) of a particular community, or guaranteeing its economic survival in the presence of change" (1998, 8). Examples that arise here are the collapse of the fisheries, such as in Newfoundland, where the moratorium on cod fishing has destroyed an entire way of life, and other primarily one-industry towns, such as Chemainus and Port Alberni, British Columbia, that have been devastated by changes in technology. Communitarianism provides a powerful rationale for compensation of certain takings, such as the expropriation of land for historical or cultural preservation or for use as public parks and roads. Lewinsohn-Zamir emphasizes that "the burden of preserving sites of historical or cultural importance should be allocated [among] all members of the community, through the tax system...[for] if one believes that community life involves a social duty, it must apply to all members of the community" (1996, 81, 89).

A final and important argument that communitarians make in critiquing the free market is that it undervalues the full social costs of the "fracturing of community." Thus, there is a rationale for government compensation:

> The national labor market has become so efficient that, for example, if the demand for spot welders declines in Cleveland and rises in Houston, a man trained in that trade is expected to respond to this market by moving from Ohio to Texas. The market cannot take into account the fact that this spot welder also happens to be an uncle, a church deacon, and a Republican ward committee man. These other roles do not comprise part of his commodity value and are therefore irrelevant for purposes of market consideration. No means exist for evaluating the loss to the community resulting from the departure of a valued family member, church goer, and citizen. The market has therefore grossly understated the full social costs attendant upon his leave taking. (Gilbert 1991, 98.)

Conclusion

Various normative rationales can be used to argue either for or against government intervention in cases of economic shock. The different perspectives diverge in significant ways. For example, an efficiency perspective focuses on the potentially inefficient incentive effects that arise because of compensation: *ex ante*, individuals may anticipate future compensation and not take steps to mitigate the effects of shocks through preventive measures or through insurance. Communitarianism, on the other hand, is concerned about existing communities and less concerned about *ex ante* effects.

The perspectives converge, however, on certain issues. All, for example, may support compensation for certain kinds of government negligence. Efficiency theorists do so because they want to deter negligence, libertarians because of the harm principle, distributive justice advocates (perhaps) because of the importance of spreading the costs of governmental negligence across the population, corrective justice proponents because of government's infringement of private actors' rights, compensatory justice advocates because of the importance of remedying past harm from unjust actions, and communitarians because of the importance of all members of society sharing the burdens of government actions.

Libertarians are the least likely to support any form of government intervention. Efficiency advocates are also often unlikely to support intervention but may do so where there is a market failure, such as the unavailability of insurance. Utilitarians may support a government role if it increases aggregate social welfare, while advocates of Rawlsian justice favor intervention only if it helps the least advantaged. Communitarians are likely supporters of state action that assists community members and binds the community. Finally, proponents of corrective justice are likely to favor state intervention if it serves to restore equality between those harmed and those causing the harm.

Clearly, the type of shock is important to the normative justification for government intervention. Natural shocks, for example, typically fail to attract calls for intervention on the basis of corrective justice, given the absence of wrongdoing. Nor do libertarians support intervention on the basis of a natural shock. Economic efficiency theorists call for intervention in cases of market failure, which suggests that natural shocks do not generally evoke government responses on the basis of this normative rationale. Distributive justice and communitarianism are the normative approaches that are least sensitive to the type of shock because proponents of these philosophies focus not on the shock's cause but on its effects.

With this relationship between the type of shock and normative rationales in mind, we turn in the next chapter to evaluating the range of policy instruments open to government should it decide to intervene.

4 Government Policy Instruments

The policy instruments discussed in this chapter are directed toward the fulfillment of two primary objectives. The instruments first described, referred to as *ex ante policy instruments,* are designed to reduce the likelihood of an economic shock's occurring. The instruments described later in the chapter, referred to as *ex post policy instruments,* are designed to mitigate the consequences of an economic shock that has already occurred.

Ex Ante Command-and-Control Instruments

Command-and-control regulations are "legislation or rules supported by sanctions and having the force of law. They are designed to limit the discretion that may be exercised by public and private decision makers" (Cassils 1991, 7). They include prohibitions and regulatory sanctions; mandated collective bargaining and advance notice of mass layoffs; advance notice of government actions; controls on inputs, consumption, and prices; and quotas for resource use and emissions.

Prohibitions and Regulatory Standards

Government can explicitly prohibit activities "that produce undesired social effects" (ibid.), or enact standards to regulate activities that are not prohibited. Standards may be established either directly or by delegation:

> Direct regulation occurs when government, or a government agency, sets specific standards or goals that are to be met. Delegated regulation occurs when the government authorizes an agency to set standards, subject to some broad terms of reference laid down by the government....[For example], a government can delegate regulatory authority to a statutory body such as the Ontario Environmental Assessment Board. (Dewees, Mathewson, and Trebilcock 1983, 41.)

Application to Economic Shocks

Seeking to prevent and mitigate damage from earthquakes, tornadoes, and hurricanes, governments often establish and enforce building codes that dictate the design and use of materials in the construction of buildings (see Dacy and Kunreuther 1969, 10; Waugh and Hy 1996, 257). Planning and zoning legislation is also used to limit development in disaster-prone areas. Structural measures, such as the building of "dams, levees, channels, seawalls, and other structures that would contain excess water and prevent ensuing floods," are used as a tool in mitigating losses from floods. Libertarians may generally prefer structural measures because "they are technical fixes that work by themselves, with or without modifying the land-use choices of individuals or communities" (Rossi et al. 1982, 7).

However, efficiency and effectiveness concerns arise with respect to both nonstructural and structural disaster-prevention instruments. These concerns include moral hazard and the inability of a national government to garner local cooperation. Local governments, which are responsible for administering and enforcing land-use regulations, may refrain from doing so as a result of a desire to have uninhibited development, particularly if they can externalize the costs of disaster relief onto another level of government. As Rossi et al. note, "one cannot take a land-use management approach to a flood or earthquake hazard unless local communities can be persuaded to pass and then enforce relevant legislation" (1982, 8). A possible solution is for the federal government to provide local authorities with subsidized insurance for their respective communities in return for complying with natural-disaster management regulations (ibid., 137) or, as discussed later, to impose a tax on noncompliance such that local governments will internalize the costs of their lack of action.

The problem of moral hazard pertains to structural measures — for example, flood-control structures, which Rossi et al. argue could "encourage, rather than discourage, habitation of the floodplains" (ibid., 7) because such projects "engender optimistic expectations of future improvements and play down the flood danger" (Dacy and Kunreuther 1969, 15). In order to cope with such problems, legislatures can impose an outright ban on the settling and development of certain disaster-prone areas; however, such policies would likely be resisted by libertarians who disapprove of command-and-control policies in general because of their constraint on autonomy and choice.

With respect to market shocks, such as those resulting from certain labor strikes, government can legislate a prohibition on such strikes or enforce back-to-work legislation after one starts. Such measures may be justified on grounds of efficiency. As Gunderson notes, strikes in the public sector often have severe third-party effects, "the costs of which are not internalized by the private parties"; hence, government may intervene to resolve the externality (1993, 28). Moreover, the occurrence of strikes could result in a decline in international competitiveness and is a "potentially important factor in international capital flows and plant location decisions" (ibid.). Advocates of distributive justice may criticize such prohibitions because they negate a potential bargaining weapon of labor, a group that at times may be among the least disadvantaged.

Unsafe workplaces, whose outcome is often a market shock resulting from corporate mismanagement within our taxonomy, are disallowed by mandatory "standards aimed at preventing occupational disease and workplace accidents" such as mining accidents (Bardach 1989, 197). Inspections take place periodically to ensure that firms are complying with the standards and providing a safe environment in which to work.

Advocates of Rawlsian distributive justice can rationalize standards because "the weakest, most susceptible, or least well informed members of society may be protected in some absolute way from some classes of harm," such as workplace hazards (Dewees, Mathewson, and Trebilcock 1983, 325–326). Hazards that lead to severe disabilities and deaths can produce drastic economic losses to individuals and families and, if the workplace is shut down as a result, can mean unemployment; hence, workplace standards can be essential to the avoidance of such shocks. Mandatory standards may prove ineffective, however, if they are not strictly enforced by public officials or if fines for their violation are minimal. In addition, regulations that dictate specific measures may be inefficient; consider, for example, cases in which providing suitable protective personal equipment or clothing is less costly than introducing safer machinery (see Ogus 1994, 189).

Takings, a government shock, can be thwarted by prohibiting the private purchase of land that public authorities are likely to take in the future. In essence, risk takers are forbidden to gamble on the investment, an outcome that libertarians may oppose. Efficiency advocates, while receptive to a result in which overinvestment in property subject to a potential taking does not occur, may object that such a rule would result in underinvestment in property that is not taken.

Standards can also be established for public officials in an attempt to avert government shocks stemming from maladministration, such as the faulty establishment of fishing quotas. Such standards can provide guidance to help with administration and impose sanctions to deter negligent conduct.

The Advantages of Prohibitions and Standards

Stewart notes that command-and-control instruments, such as bans and health and safety standards, are often preferred to market-based incentives, such as corrective taxes, because "the system is well-developed and reflects considerable operational experience" (1984, 1264). In addition, the use of uniform standards across an industry avoids the need for firms to establish rules independently. Arguably, this minimization of costs enhances social welfare and aggregate utility.

Some scholars acknowledge that command-and-control instruments also offer certain political advantages. "A prohibition against a harmful activity has symbolic value for politicians because voters identify such a prohibition as taking a strong stand against the activity" (Dewees, Mathewson, and Trebilcock 1983, 38–39). On the other hand, a tax on the overuse of natural resources or on workplace injuries, for example, "has much less symbolic value, since it concedes immediately that the activity need not be terminated nor even reduced" (Trebilcock et al. 1982, 93). In sum, certain bans and standards can win political support from sectors of the public who favor a strong stand.

The rationale behind government intervention in health and safety matters "is often the prevention of serious harm which command-and-control can assure" to a greater extent than incentives (Stewart 1981, 1264). Hence, some libertarians may support bans and standards that seek to prevent grave physical harm to individuals. There is also a Rawlsian distributive justice rationale behind the use of such regulations because "the weakest, most susceptible, or least well-informed members of society may be protected in some absolute way from some classes of harm" through direct regulation (Dewees, Mathewson, and Trebilcock 1983, 325–326). Bardach cites the belief that the weak or vulnerable who are victims of "unjustly operating markets" should be aided through government intervention in the form of regulatory programs (1989, 210).

The Disadvantages of Prohibitions and Standards

Prohibitions and standards may prove ineffective if they are not effectively enforced by public officials. In the environmental realm, Stewart notes, "statutory deadlines for achieving air and water pollution control objectives have been repeatedly postponed" (1981, 1260). Lack of enforcement of workplace safety standards, such as mining regulations, can lead to seriously adverse outcomes.

An efficiency argument against command-and-control regulations is that of inflexibility and uniformity:

> [B]ureaucratic structures lack the flexibility to adapt to and manipulate changing environmental conditions. They possess no inherent mechanism for equilibrating marginal costs and benefits in particular cases; and they may enhance co-ordination at the expense of innovation. (Tuohy 1989, 183.)

Although, as noted above, uniformity saves some costs, this argument is countered by the claim that it inhibits innovation. "A single rule enforced by a centralized agency cannot measure all the diverse transaction costs, side effects, and technical developments for large numbers of geographically dispersed producers and consumers. Hence, there is a tendency toward overregulation" (Balch, 51). Overregulation, in turn, "may truly inhibit innovation" as firms may hesitate to develop new products or technologies, for example, due to the fear of potential regulatory sanctions (ibid.). In addition, with uniform standards, "actors will not be motivated to apply or develop cheaper modes of abatement" of certain harms if they already meet the established regulatory standard (Ogus, 783).

Another concern is that the total resources required for developing, monitoring, and enforcing command-and-control regulations can be quite high. A solution, offered by Howse, is to "delegate some key monitoring functions to actors who have an interest in the compliance of other private actors with public goals" (1993, 476). For example, workers, who are often the beneficiaries of health and safety standards, could be provided "with real clout and capacity to monitor and enforce standards." This solution would also be "normatively superior" as it would give workers a voice and enhance distributive justice by alleviating imbalances of power (ibid., 477).

Another critique of command-and-control prohibitions and mandatory standards is advanced by some libertarians who believe that such regulations involve a "nullification or limitation of choice" and hence of autonomy (Stone 1989, 208). They condemn "the supposed intrusiveness of regulation; its interference with enterprise, personal freedom, and privacy" (Bardach 1989, 210). Stone discusses the interference of regulation with the autonomy of enterprises:

> To ensure workplace safety, industrial boards lay down mandatory safety rules that substitute the government's notion of the ideal harm-avoiding measure for the enterprise. In effect, we withdraw from the enterprise the power to determine the ideal solution on its own, subject to the prospect of fines and punitive damage awards should its choices turn out badly and a worker be injured. We do not grant the licensees of nuclear plants full autonomy to decide how to protect the public, subject only to the condition that if there is a catastrophe, they will be held accountable. Instead public agencies require nuclear facilities to adopt certain physical and bureaucratic preventive measures as a condition of doing business. (Stone 1989, 208.)

A final critique of command-and-control prohibitions and standards comes from communitarians. Since they are advocates of social solidarity, communitarians are concerned that, in the absence of careful management, "coercive control through negative sanctions may produce feelings of resentment, alienation, and may lead to dysfunctional behavior on the part of its recipient," potentially disrupting the community (Grabosky 1995, 26).

Mandated Collective Bargaining

Employees may make safety-related demands. Government can mandate or, at minimum, facilitate the formation of joint labor and management committees in order to promote dialogue between the two parties concerning issues such as health and safety (see Harter and Eads 1985, 227). Thus, legislatures can indirectly induce management to establish workplace safety standards. In addition, "the outcomes of the collective bargaining process can be an important source of information for policy-makers on the preferences of workers," consequently aiding them in setting standards efficiently (Gunderson 1993, 10).

A communitarian rationale for collective bargaining between management and labor is the avoidance of disputes and conflict and the promotion of mutual understanding and trust (see ibid., 14).

As noted above, collective bargaining can serve to establish workplace safety standards, which, in turn, can help prevent workplace disasters from occurring, for example, in the mining and nuclear industries. Collective bargaining committees can also discuss issues of technological market shocks and potential labor displacement. With labor and management cooperation, "suggestions to improve productivity and save jobs can be implemented," and joint committees can also develop "a mutually acceptable assistance plan for workers faced with disruptive change" (Newton et al. 1990, 246).

Advance Notice for Plant Closings and Mass Layoffs

As long as the risk of an economic shock is present, the risk of unemployment is also present. Workers may be displaced because of market shocks such as technological change, shifts in demand, shifts in comparative advantage, and the depletion of natural resources. If companies are aware of an impending shock, such as a change in technology, or can forecast a detrimental shift in comparative advantage that would lead to labor displacement, employees could benefit from being given advance notice of probable permanent job loss.

Advanced notice requirements for plant closings and mass layoffs "may be rationalized as a way of getting employers to reveal private information pertaining to the impending layoff" (Kuhn, discussed in Komesar 1994, 15). Komesar notes that employees "may be better off by the more systematic job search that could result from the advance notice" (ibid.). Hence, there may be a utilitarian argument in favor of notice requirements, as aggregate social welfare could increase as a result. Howse argues that workers can adjust to job loss more effectively when they have advance notice and are able to begin searching for a new job while still employed: "Workers may be more self-assured in looking for alternative employment while still employed, [and] the workplace structure can provide the foundation for mutual support groups" (1993, 482). Validation for the provision of such support groups can be found in communitarianism, which advocates community solidarity and mutual care.

Thus, Howse and Trebilcock argue, the "empirical evidence appears to suggest that significant advance notice periods substantially ameliorate the adjustment process and reduce the amount of unemployment subsequent to closure." However, such regulatory requirements "may induce firms to locate or relocate to jurisdictions that do not constrain their flexibility in this fashion" (1993, 787, 788), hence defeating the purpose of unemployment prevention.

Advance Notice for Government Shocks

Government shocks, such as trade liberalization, deregulation, and privatization, can result in firm closings and labor displacement if companies, especially those that are inefficient, are not given enough time to prepare themselves for the introduction of or increase in domestic and international competition. Hence, governments' providing advance notice that, for example, tariffs will gradually be reduced and eventually eliminated within a specific time period may give companies the breathing space they need to adjust with a minimum of economic dislocation.

Input Controls, Consumption Controls, and Price Controls

Another way in which government can act to prevent or mitigate economic shocks is by imposing one or more kinds of controls. *Input controls* restrict the use of production inputs, largely with respect to environmental risks but also in response to energy shocks. Such controls may enhance productivity as industries and firms are forced to find more productive methods of manufacturing with a smaller amount or alternate sources of inputs. *Consumption controls* restrict the use of final products; the rationing of gasoline is an example. *Price controls* usually dictate the maximum allowable price a seller can charge, but they can also include the minimum allowable price.

In the case of, say, a drastic increase in the world price of oil, government can place a ceiling on the prices that domestic energy providers can charge. Some economists may argue against such a policy, however, because they believe that price controls during the oil crises of the 1970s "caused markets to malfunction and created allocative inefficiencies in petroleum and in numerous goods and services" (Horwich and Weimer 1984, 101). Ogus notes that "standard economic analysis suggests that controlling prices is likely to be the least effective solution…[because] there will be a reduction in the quantity of the commodity produced" (1994, 296). Horwich and Weimer concur, noting that price ceilings during the 1970s' oil crises "left the petroleum product markets in a state of shortage." Nonetheless, a policy of price controls finds some support in distributive justice because low-income families are often the ones most adversely affected by increases in energy prices. Consequently, a primary "goal of the price ceilings [is] to keep petroleum products affordable to...those with low incomes" (ibid., 102).

The distributive justice approach is complicated in Canada by the extensive provincial ownership of oil resources, particularly in Alberta. Property and civil rights are at the center of provincial constitutional powers, implying that such rights are part of the legitimate endowment of provincial residents (Boadway, Flatters, and

Leblanc 1983, 176). The fact that these resources are very unevenly distributed among provinces has led to political pressure from resource poor provinces for price controls, as during the 1970s' oil shocks, and for equalization of resource revenues through intergovernmental transfers from the "have" to the "have-not" provinces. Indeed, during the 1970s' oil shocks, price controls and equalization payments became very controversial as they were essentially subsidies from the residents of oil-producing provinces — largely Alberta — to the residents of other provinces. Such transfers do not advance distributive justice principles unless there is a systematic correlation between the state-owned natural resources of a province and the wealth of its residents.

Agricultural marketing boards provide examples of a price floor — a minimum allowable price. Such boards seek to stabilize farm incomes, shielding farmers from unfavorable fluctuations in the market. International shocks that produce a drop in the market price of agricultural commodities or that decrease demand for such products can severely undermine the incomes of farmers. However, although farmers are aided, a large number of consumers or taxpayers are negatively affected by such stabilization policies as they entail a redistribution from consumers or taxpayers to farmers (see Trebilcock et al. 1982, 95).

Quotas

In order to prevent the depletion of natural resources and avoid the resulting labor displacement in resource-based industries, governments may establish and enforce quotas for the purpose of limiting, for example, the number of fish each fisherman can catch. Such quotas are often supported on grounds of efficiency because they address externalities and attempt to avoid the tragedy of the commons. Such quotas may prove ineffective, however, if public officials overestimate the abundance of the resource and consequently set the quotas too high or do not enforce them effectively. Hence, governments must take care in developing such quotas, as well as in monitoring and enforcing them.

Although policymakers have a selection of instruments to use toward achieving certain social goals, such as the conservation of environmental resources, some policy tools are deemed preferable to others in situations of uncertainty. Consider, for example, the supply and demand of nonrenewable resources or the costs and benefits of pollution abatement. Weitzman argues that, given uncertainty, if the marginal cost curve for abatement is much flatter than the benefits curve, the smallest miscalculation or change — say, through the use of price instruments such as corrective taxes (discussed later) — results in either much more or much less than the desired quantity, with detrimental consequences. In such cases, the use of quantity instruments, in the form of quotas, targets, or commands to produce a certain level of output, is preferred because of the high premium placed on controlling output (1974, 485). On the other hand, he claims that, if the marginal benefit function curve for abatement is much flatter than the cost curve and thus marginal social benefit is approximately constant in some range, it is better to identify that amount as a price and allow producers themselves to find the optimal output level (ibid.).

Wiener (1999) advances another argument about abatement costs under conditions of uncertainty. Setting a tax, he says, constrains the maximum marginal cost that sources have to pay, but it yields an uncertain level of emissions; if sources' true costs of abatement are higher than the regulator has predicted, the tax will generate less abatement and higher emissions. By contrast, setting a quantity of emissions constrains the maximum level of emissions but yields an uncertain cost. If sources' true costs of abatement are higher than the regulator has predicted, the quantity limit will generate higher costs. In sum, pricing instruments prevent compliance cost overruns but risk emissions overruns, whereas quantity instruments prevent emissions overruns but risk cost overruns. Policymakers must determine which risk is of greater social concern in choosing between a quantity-based constraint and a price-based constraint under uncertainty (ibid., 728).

Ex Ante Judicial Instruments

Among the instruments government has available to counter economic shocks are judicial actions under either criminal or civil law.

Criminal Liability

The threat of criminal liability is an instrument that can be used both as an enforcement mechanism for command-and-control regulations and as an independent tool to address shocks. As an enforcement mechanism, the possibility of severe fines and imprisonment serves to raise the costs of noncompliance and risky behavior significantly and may be enough to "discourage the actor from crossing the threshold between the lawful and unlawful zones" (Ogus 1998, 777; see also Komesar 1994, 178).

As a separate tool, the possibility of criminal liability is likely to deter firms from engaging in conduct "which could be regarded as murder, manslaughter, or criminal negligence" (Harter and Eads 1985, 225). Glasbeek argues that "injuries and deaths in the workplace could be treated as assaults and killings of the kind normally sought to be controlled by the criminal law proper, rather than by civil or administrative schemes" (1984, 393). He believes that "[p]rosecution under the criminal law of employers for the harm they do to workers rather than reliance on existing safety and health regulatory schemes would characterize the conduct of such employers as an unjustifiable preference for unregulated profit over the well-being of human beings" (Glasbeek and Rowland 1979, 523) and perhaps would be more effective in deterring risky activities. However, as he and his co-author note, "one of the difficulties with using criminal law in [this] way...is a built-in reluctance to stigmatize as criminal an activity that is regarded as being productive" (ibid., 578).

A general problem with using the criminal law as an instrument of punishment and deterrence is that it is costly and complex, involving a demanding burden of proof. As Ogus says, "the use of the criminal law adds significantly to enforcement costs in individual cases. There is a more stringent burden of proof, as well as rules of evidence and other procedural devices designed to safeguard against wrong convictions" (1998, 780). And as Tuohy and Trebilcock point out, "[t]he fact that an offence must be proved beyond a reasonable doubt in a criminal context makes successful prosecutions extremely difficult in any setting where scientific uncertainty and controversy, long lags between exposure and symptoms, and difficulties in identifying causation linkages are central features of that setting" (1982, 7.51). In addition, "in interpreting criminal legislation, courts are apt to adopt a more literalist approach and ambiguities are construed so as to favor the accused," a situation that "enables firms to engage in what has been described as 'creative compliance,' activities which offend the spirit but not the letter of the law" (Ogus 1998, 780).

The possibility of criminal sanctions may be a useful enforcement mechanism against individuals who ignore building codes in their construction of buildings in disaster-prone areas, resulting in destruction, loss of life, and other damage when a natural shock occurs. Corporate mismanagement, resulting in the manufacture of unsafe products and in accidents in hazardous and unsafe workplaces, can be subject to criminal liability independent of regulatory sanctions if workers are severely injured or killed. Criminal liability may be inappropriate, however, where numerous factors contribute to workplace disasters.

Criminal liability could be extended to the maladministration of public officials as well, in the aftermath of a government shock, such as public mismanagement in the enforcement of safety standards. It might be particularly difficult, however, to find liability on the part of a particular public official because the perceived need to insulate public officers from liability for their *bona fide* policy decisions has led to safeguards that prevent public officials from being prosecuted for certain actions. More generally, the threat of criminal liability might overdeter in the sense that the undiversifiable prospect of criminal liability might make actors too cautious in the face of threats from economic shocks. In sum, the criminal law may often be ineffective in optimally deterring the occurrence of economic shocks.

Civil Liability

Failure to comply with required standards or to fulfill a common law duty, such as the employer's duty to provide a safe and healthful workplace for its employees, can result in liability in tort law and the injurer's having to pay compensation to the victims. Law and economics scholars such as Calabresi, argue that tort law, as an instrument of deterrence, promotes efficiency. Rabin says of Calabresi:

> [H]is conception of general deterrence anticipated a market economy in which the prospect of tort liability, recognized as a cost of operations, forced those engaged in injury-generating activity to choose a level of production that promoted allocative efficiency. (1989, 79.)

Or, as Trebilcock says, [b]y confronting prospective injurers with the threat of damage awards, forward-looking incentives to take proper levels of care and avoid excessively risky activities are created" (1989, 473).

Within the realm of tort law are differing policy instruments, including negligence, strict liability, and the private enforcement of public standards. Under a law and economics negligence framework, "an individual or firm will be found liable for the full cost of an accident if the cost of avoiding that accident was less than the expected cost" of the accident; consequently, "it must be possible to calculate accurately the costs and benefits of accident avoidance" (Tuohy and Trebilcock 1982, 7.2, 7.3). However, Rabin notes that, as a result of the perceived increase in noneconomic damage awards (for nonpecuniary losses and punitive damage), some scholars contend that "predictive judgments about costs can no longer be made with any degree of confidence" (1989, 85). In addition, Dewees, Mathewson, and Trebilcock note that "[i]n assessing the costs of taking preventive action,...[f]irms will have a clear incentive to exaggerate preventive costs so as to make more accidents seem to be cost justified" (1983, 32). Hence, individuals and firms may be unlikely or unable to engage in productive and accurate cost-benefit analyses, and inefficient outcomes may occur as a result.

In addition, some scholars argue that the negligence regime may not be an efficient instrument because of its complexity — for example, the need to cope "with multiple and uncertain causation in case-by-case litigation" — and because of the substantial financial resources required for litigation, paid by both the claimant and taxpayers (Stewart 1981, 1263). Tuohy also notes that, "[i]n terms of technical efficiency, the laborious and time-consuming requirements of the adjudicative model do not score well" (1989, 184).

Under strict liability, say Tuohy and Trebilcock, "the defendant will be held liable for any injury he causes, regardless of whether or not there is any negligent behaviour on his part." (1982, 7.28). With regard to efficiency, this strict liability regime can be advantageous because

> it does not require either the individual plaintiff, a court, or a government agency to calculate the costs and benefits of accident avoidance....[I]t is the company itself which is forced, at least implicitly, to make the calculus. Such a situation is preferable ...since it is the firm which has best access to information, so it is in the best position to estimate accurately the costs and benefits of avoidance. (Ibid., 7.28–7.29.)

As in the case of negligence, however, firms may undervalue the benefits of accident avoidance that could "lead to less than full internalization of costs" (ibid., 7.29). In addition, plaintiffs may still face difficulties proving causation (see ibid., 7.34).

With regard to the private enforcement of public standards, "the government, or a related agency, would set the desired safety levels but it would be left to aggrieved individuals to initiate civil actions for breach of the prescribed safety standards" (ibid., 7.22). It is important to note that, in Canada, the breach of a statutory regulation serves solely as "evidence of negligence as opposed to recognition of a nominate tort of statutory breach" (*Saskatchewan Wheat Pool*, discussed in Weinrib 1995, 313). The advantage of such a regime is that the plaintiff faces a smaller burden of presenting "evidence on the issue of costs and benefits of avoidance"; however, government must be able to accurately assess the costs and benefits of accident avoidance in establishing standards. In addition, issues of causation may still be problematic for the plaintiff (Tuohy and Trebilcock 1982, 7.23, 7.24).

Arguments against the use of civil liability can be found within the distributive justice and communitarian rationales. As Dewees, Mathewson, and Trebilcock observe, "[d]epending on the stringency of the liability regime, it is possible in some cases that exposing a firm to full liability for damage associated with its activities may render it no longer economically viable" (1983, 35). Hence, civil liability regimes may result in the unemployment of workers with few, if any, viable alternatives. Communitarians may also oppose the use of the tort regime because firms may be rendered economically unviable as a result, and workers will be displaced and communities adversely affected.

A final critique of legal liability is the imperfect and incomplete solution that it offers. As Dewees, Mathewson, and Trebilcock note, "the inability (and inappropriateness) of courts as an institution to deploy subsidy policies to facilitate safety improvements or relocation, retraining, or retirement decisions by employees may render a civil liability regime an ethically inadequate response to the quality problem" (ibid., 35; see also Tuohy and Trebilcock 1982, 7.41). In addition, Epstein notes that, because of the comprehensive administrative provisions and detailed benefit rules involved in workers' compensation, such an elaborate solution "could not have been introduced by judicial decision" (1982, 1737).

Overall, the possibility of civil liability for potential damages may be sufficient to deter landlords and building managers from ignoring building codes and safety requirements aimed at preventing damage from natural disasters. Individuals who have suffered severe losses from natural disasters may not, however, have the resources or time to pursue civil litigation within the requisite limitation period. The same can be said for workers who have suffered as a result of product-related accidents caused by corporate mismanagement. In addition, as noted in the discussion of criminal law, issues of causation may be complex and difficult to prove.

Nonetheless, the tort system may sometimes be able to deter firms and individuals from violating building codes and ignoring product standards and workplace safety. During the early 1980s, the casualties stemming from exposure to asbestos received media attention, and "damage claims by workers exposed to asbestos and their families (then constituted) the largest, and potentially most costly, block of product liability litigation ever to confront American industry" (Tuohy and Trebilcock 1982, 6.25). Moreover, issues of causation are not necessarily problematic. Glasbeek and Rowland note that, in *Central Asbestos Co. v Dodd,* a case involving workers diagnosed with asbestosis, a disease directly related to the inhalation of asbestos fibers, "it was not doubted by the courts considering this and associated cases that the necessary causal connection between exposure to asbestos and disease to permit a finding of liability in tort had been established" (1979, 585).

Ex Ante Incentives

Incentives involve "pricelike mechanisms" whereby government "reduces the cost of the desired activity, or increases the cost of its competitors, or both" (Balch 1980, 38). Incentives may be preferred policy tools for various reasons. Economists often stress the efficiency of incentive strategies that "get people to change their behaviors by raising the relative attractiveness of the desired behaviors. Beneficiaries then change their routine *voluntarily*" (ibid., 55).

This perceived voluntariness and choice have made incentive strategies popular among many libertarians. Some scholars argue that incentives are favorable because they are "more freedom-enhancing" (Grabosky 1995, 262). In addition, communitarians often support incentive-oriented instruments. As discussed in the section on command-and-control instruments, "coercive control through negative sanctions may produce feelings of resentment (and) alienation" (ibid.). In contrast, "incentives are more likely to be perceived as legitimate and are less likely to alienate their subjects than are coercive instruments of control," and hence, more likely to foster solidarity (ibid.).

Negative Incentives

Incentives may be either negative or positive. Negative incentives entail "penalties and other negative sanctions" (Grabosky 1995, 258), which include corrective taxes, mandatory insurance, and symbolic punishment.

Corrective Taxes

Economists often assert that corrective taxes can efficiently solve the problem of externalities by equating private costs with social costs. As Ogus notes,

> while the application of corrective taxes to the pollution problem has dominated both theoretical and policy discussion, the device has been, or potentially can be, used to correct a wide range of other externalities, including...the overexploitation of scarce natural resources...[and] work accidents. (1998, 768.)

To induce economic agents to internalize the costs of their actions, government could impose corrective taxes on individuals who settle in areas prone to natural disasters or on individuals and firms that ignore building codes and regulations. Individuals living in disaster-prone areas who are injured or lose property in the event of a natural disaster may receive assistance from relief programs and services funded by taxpayers. Thus, corrective taxes would seek to internalize this risk of costs to third-party taxpayers. The same can be said about individuals and firms that violate building regulations, resulting in harm to third parties, and about the funding of assistance to those suffering losses by other third-party taxpayers. Similarly, to internalize the costs of public compensation, a tax could be imposed on an individual who settles on land that has a high probability of being taken by government.

With regard to workplace safety, injury taxes — for example, in the form of workers' compensation levies — increase the cost of failing to prevent accidents and thus can be effective in limiting corporate mismanagement. Workers' compensation "is a no 'fault' system designed to provide injured employees with compensation for injuries and illnesses arising out of their employment" (Harter and Eads 1985, 225). Evidence exists that workers' compensation premiums may cost far more than regulatory fines and, consequently, can provide a much stronger incentive for managers to enact preventive safety measures (see Trebilcock et al. 1994, 37). Ogus argues, however, that the tax system in general "cannot provide appropriate incentives for socially desirable levels of care in relation to risks of relatively low probability" (1998, 784). More specifically, since "the contributions levied...[on] firms to finance the compensation payable to victims are…[often] calculated by reference to the firms' accident record," the potential occurrence of an infrequent but serious accident is not included in such calculations (ibid., 252). Consequently, excluding the risk of such devastating accidents, resulting in severe injuries and labor displacement, may result in the setting of less-than-optimal taxes and less-than-optimal abatement. The same applies to excluding the risk of rare but catastrophic natural disasters in the calculation of taxes under the realm of natural shocks (discussed above).

Advantages. "Economists support such market-oriented…[taxation] remedies because they internalize the externality, and therefore allow a more efficient outcome" (Dewees, Mathewson, and Trebilcock 1983, 325). Skea comments that such taxes send "the 'correct' economic signals at each stage of the production process" (1996, 174). And Tuohy says "[t]hey encourage individuals and groups to make cost-benefit trade-offs. The individual...will presumably comply up to the point at which, for him, the marginal cost of noncompliance equals its marginal benefit" (1989, 188). As a result of the *ex ante* nature of taxes, private actors are able to engage in definitive cost-benefit analyses and thus are better able to employ their resources efficiently (see Ogus 1998, 784). Also, unlike command-and-control regulations, incentives lessen the costs to government of information gathering since private actors reveal their preferences and constraints (see Balch 1980, 54; Ogus 1998, 768).

Another advantage is that corrective taxes, unlike command-and-control regulations, may provide incentives for technological innovation (see Skea 1996, 174; Dewees, Mathewson, and Trebilcock 1983, 37). By allowing flexibility in an environment in which firms have different abatement costs, a pricing system will "generate more efficient incentives than a deterrence system which promulgates uniform standards since, under the latter, actors will not be motivated to apply, or develop, cheaper modes of abatement" if they already meet the regulatory standard (Ogus 1998, 783).

Corrective taxes are also beneficial because they correct for socially harmful behavior, and because the revenue they create may displace other taxes, such as the general sales tax and the income tax, that are distortionary. With respect to the former benefit, revenue raised can be earmarked "to pay for a public facility which eliminates or reduces the negative external effect of the product that is being taxed" (Kraan 1998, 111). Moreover, Ogus notes, revenue can also be earmarked to compensate the victims of externalities (1998, 768), providing a compensatory justice justification for regulatory taxes. Regarding the replacement of distortionary taxes, commentators have criticized the general sales tax — that is, the value-added tax or goods and services tax — for producing a wedge between the amount demanders must pay and the amount suppliers must receive to engage in a market transaction and consequently impeding the use of market prices as a signal for the allocation of resources. Similarly, analysts criticize the income tax for imposing distortions on capital markets by taxing the return on holding assets and on labor markets, since leisure is untaxed while wage payments are taxed (Boadway, Bruce, and Mintz 1987, 27, 31). To the extent that the use of corrective taxes can reduce government's reliance on sales and income taxes, these distortions and inefficiencies can be curtailed.

Disadvantages. Despite these theoretical arguments in favor of corrective taxes, they are rarely used in practice, largely as a result of political constraints. Ogus notes, "[e]conomists themselves have argued that the very effectiveness of corrective taxes in constraining socially undesirable behavior renders them unattractive to those industries which would be most affected; and these same industries are typically powerful pressure groups that can exert a profound influence on policymaking" (1998, 769). Dewees, Mathewson, and Trebilcock claim that "when it is effective, the tax would often impose still higher costs on firms (than direct regulation) because, after paying for reducing their harmful activity, they must also pay for any remaining harm" (1983, 39; see also Skea 1996, 175). In addition, as already noted, politicians may instead prefer to implement regulatory sanctions and prohibitions, which are likely to garner the support of a number of voters who perceive them as a strong stand against undesirable behavior (see Trebilcock et al. 1982, 93). A corrective tax, on the other hand, "has much less symbolic value since it concedes immediately that the activity need not be terminated, nor even...reduced. Thus, the benefits perceived by the public are less for a tax system than for regulatory standards" (Dewees, Mathewson, and Trebilcock 1983, 39).

In addition to public choice explanations, other disadvantages have also contributed to the limited use of regulatory taxes. For example, one of the most difficult challenges in designing corrective tax systems is the assessment of appropriate tax rates. Ogus notes that "it may be very difficult for the authorities to form feasible estimates of the risks generated by individual actors" and that, "if the tax rate is too low, failing fully to reflect the difference between the private and social cost of the activity, predictably there will be insufficient abatement. Conversely, if the sanction is too high, there will be more abatement than is economically justified and welfare losses will ensue" (1998, 784, 778), possibly inducing opposition from advocates of both efficiency and utilitarianism. With regard to the preservation of natural resources and the environment in general, Trebilcock et al. note that "quantifying all relevant environmental values is a highly speculative exercise at best" and misestimations can have grave effects, particularly if there are critical environmental thresholds, the crossing of which results in significant losses (1994, 35).

Another efficiency concern involves the administrative costs of a corrective tax program. Although economists argue that tax systems are cheaper to administer than regulatory sanctions or judicial instruments, they are nonetheless costly. As Dewees, Mathewson, and Trebilcock note, "any system that is based upon...the performance of a firm will likely require a substantial expenditure for monitoring, regardless of the precise type of policy to be employed" (1983, 38).

In addition, Ogus notes, even if pricing systems are cheaper for public agencies to administer as they "are relieved of the task of determining optimal loss abatement, the need for such determination does not disappear; rather it is transferred to the actor" (1998, 776). In some situations, this shift may be efficient as it may be cheaper for private actors to gather the necessary information. In other situations, however, an economy of scale or public goods argument may support government determination of optimal loss abatement, "particularly if there is homogeneity of activity and of its harmful consequences within an industry" (ibid., 777). In addition, from a distributive justice perspective, a corrective taxation policy that transfers the costs of determination to the industry is detrimental if "the industry comprises mainly small firms which have limited resources available for acquiring information" (ibid.). Distributive rationales can also be employed against market-oriented taxation policies and in favor of regulatory prohibitions and standards ensuring that "the weakest, most susceptible, or least well-informed members of society be protected in some absolute way from some classes of harm that may result from market operation" (Dewees, Mathewson, and Trebilcock 1983, 325).

Other ethical arguments maintain "that some choices such as... hazardous workplaces should not be offered in the marketplace at all, even with taxes to discourage their use, because there are some risks to which no person should be subjected, or allowed to subject himself" (ibid., 40).

Mandatory Insurance

Government could mandate the carrying of private insurance by individuals who choose to live in disaster-prone areas or on land likely to be taken. From an efficiency perspective, mandatory insurance might be beneficial because insurance premiums would force investors to account for natural disasters and takings risks "by requiring them to pay in advance for expected losses" (Kaplow 1986, 550). Indeed, having to internalize such costs might encourage investors to avoid settling in such risky locations. Mandatory insurance might also limit adverse-selection problems and allow government to commit itself to not providing compensation following an economic shock.

Symbolic Punishments

Another approach is for government agencies to publish the names of firms that ignore building code regulations geared toward the prevention of losses from natural disasters, that violate conservation targets aimed at preventing the depletion of nonrenewable resources, or that mismanage the manufacturing of products or workplace safety, potentially resulting in accidents (see Yamaji 1998, 156). Such a punishment would not involve any direct monetary penalties, but instead might take the form of adverse publicity, which would harm a firm's reputation and image and indirectly result in lost revenue and profit.

This policy instrument would require minimal expenditure on the part of government, but one wonders about its effectiveness. Only a small number of consumers might alter their behavior in the face of such information. A free-rider problem might exist among those consumers — each relying on others to punish the wrongdoer. Moreover, only a few might take the time to obtain and read such government material. A possible solution is to make such publications more accessible and to use other vehicles — for example, firms violating conservation targets could be listed in environmental magazines.

Nevertheless, it is uncertain whether the symbolic punishment of bad publicity would provide powerful incentives for better behavior.

Positive Incentives

Positive incentives entail rewards designed to induce desirable behavior and compliance with policy goals. This class of incentives includes direct subsidies, tax expenditures, and symbolic rewards.

Overall, positive incentives are beneficial to the extent that they induce desirable acts that might otherwise not take place. For example, socially desirable actions that can only be "achieved under great risk or sacrifice will necessitate some inducement or will merit some recognition" (Grabosky 1995, 273).

But unlike corrective taxes, positive incentives do not generate revenue; indeed, they may involve direct government expenditures. Moreover, the costs of monitoring compliance — for example, with subsidy conditions — and administering such programs may be prohibitive. In addition, the "use of incentives can be gratuitously expensive, especially when they entail paying people to do what they would be doing ordinarily" (ibid., 268; see also Trebilcock, Howse, and Chandler 1990, 96).

The public choice model warns against such programs, noting that the lobbying efforts of interest groups may result in the persistence and expansion of incentive schemes that are inefficient or otherwise undesirable (see Neiman 1980, 36). Grabosky cites the example of agricultural subsidies that some argue "achieve nothing more than the appeasement of sectional interests" (1995, 268).

Another efficiency argument against positive incentives is that of moral hazard. Grabosky notes: "One of the potential risks inherent in reward systems is...the incentive to orchestrate an externality in order to claim an award for its abatement" (ibid., 268). For example, a farmer may intentionally set fire to an inferior yield of crops if he can obtain more money through the consequent provision of a direct subsidy or subsidized loan.

The communitarian perspective may offer a critique of positive incentives because such "extrinsic reward(s) can undermine intrinsic motivation....[Some scholars] speculate that cooperation with law enforcement authorities may become increasingly driven not by public-spiritedness but by financial considerations." Some evidence supports such a proposition (Grabosky 1995, discussing Smith and Statlins). The notion of citizenship is fundamental to communitarians. They strongly believe that individuals have social responsibilities and obligations to enhance the good of society (see Loewy 1991, 55). Thus, they criticize the use of positive incentives because of the belief that "[c]itizens should not be rewarded for doing their [civic] duty, but rather punished for failing to do so" (Grabosky 1995, 267). The long-term effects of such rewards may prove detrimental to communities; "by weakening the norms of deliberate cooperation and social restraint...[such tools produce] an unstable system over time" (Hirsh, quoted in Neiman 1980, 31).

Direct Subsidies

A subsidy is "a transfer payment from the public treasury to a private enterprise or person" (Stone 1980, 253). Subsidies are often tied to conditions specifying obligations on the part of the recipient; hence, they are in between regulations, which entail an existing legal duty to do or not do something, and welfare payments, which may not entail any obligation to undertake any particular activities. "In providing an incentive subsidy to private individuals or firms, the government seeks to change market behavior from what it would otherwise be" (ibid., 256).

With regard to natural shocks, government could provide individuals with subsidies for relocation, inducing them to move away from disaster-prone areas. Such subsidies would likely be one-time payments, thus avoiding the problems of dependency and indefinite involvement on the part of government. However, subsidies may be unnecessary if individuals are likely to relocate on their own once the high probability of a natural disaster is revealed. Moreover, the availability of subsidies may produce moral hazard in that they might encourage people to settle in disaster-prone areas with the knowledge that if such locations become increasingly risky places in which to live, government will subsidize their relocation.

Industries that are adversely affected by shifts in demand or in comparative advantage or by government policy decisions to liberalize trade may be given subsidies to help them stay in operation. However, the provision of subsidies to industries facing long-term structural decline, such as the textile, clothing, and footwear industries in North America, may place government in an indefinite relationship with firms and prevent a more efficient reallocation of resources. Gunderson notes that market mechanisms

> emphasize adjustments at the *margin* (e.g., reduced new hiring, attrition) and these can be less painful and disruptive than inframarginal (relatively large) adjustments (such as plant closings) that ultimately may be necessary if marginal adjustments are not made in the direction of basic market forces. (1993, 4.)

Subsidies, on the other hand, distort market mechanisms and may prevent essential adjustments at the margin, eventually resulting in the need for more drastic adjustments.

In addition to providing assistance, government could also offer subsidies to firms as a reward for achieving and maintaining safe workplaces, consequently reducing the possibility of workplace disasters. Government could also use subsidies to promote innovation in the development of domestic energy sources and energy-conserving products in order to eliminate vulnerability to international oil price shocks.

Advantages. Subsidies may be beneficial and efficient in the short run

> if firms or industries are only in decline because of temporary changes in demand or prices; once the cycle turns up, the subsidy will no long be needed. In theory, the social costs of the disruption caused by market vicissitudes (costly redeployment of assets through bankruptcy proceedings, sudden large scale lay-offs) may exceed the cost of the subsidy. (Trebilcock, Howse, and Chandler 1990, 81.)

Governments in different countries have, at times, provided subsidies to failing firms in order to maintain output and avoid a large displacement of workers. The provision of such subsidies is most defensible in one-industry communities and in communities where the level of unemployment is already high (ibid., 125). The social costs of industry failure in such cases can be severe, and from a communitarian perspective the avoidance of mass labor dislocation is essential to minimize community disruptions. Lastly, because subsidies are often tied to specific guidelines and obligations on recipients, they may be more effective in achieving policy goals than other instruments, such as tax expenditures (see Maslove 1994, 181).

Disadvantages. Although subsidies may be beneficial in the short term, "as a strategy to address longer-term declines in demand or in comparative advantage, output and employment maintenance they are economically disastrous" (Trebilcock, Howse, and Chandler 1990, 81). In addition, Grabosky notes, "analysts of corporate economic performance have observed that subsidies, by encouraging a dependence mentality on the part of their recipients, tend to delay, rather than promote, innovation" (1995, 266).

Another efficiency problem that emerges is that of moral hazard. As already noted, "firms and individuals may inefficiently alter their behaviour to qualify for the subsidy" (Dewees, Mathewson, and Trebilcock 1983, 37). In addition, if the general perception is that government will intervene and provide subsidies in order to save companies from failure, managers may become less conscientious and more lax in the management of their respective firms (see Grabosky 1995, 269). The expenditure of resources required to guard against moral hazard and to ensure compliance with subsidy goals, when combined with the direct cost of the subsidy, may prove severely inefficient. As already noted, Howse suggests that, to alleviate such costs, government could delegate monitoring functions to interested private actors. For example, in the case of an industrial subsidy designed to promote long-term job creation, workers themselves — the true beneficiaries — can play an active role in monitoring the firm's use of subsidies and requiring that the firm disclose information concerning its corporate strategies (1993, 476–477).

Utilitarians also tend to oppose subsidies to promote employment maintenance because "they have, generally speaking, retarded reallocation of resources to more efficient uses within domestic economies, while at the same time they only postponed, not prevented, the final costs of large-scale labour-shedding in declining industries" (Trebilcock, Howse, and Chandler 1990, 108).

From a libertarian perspective, subsidies are not desirable because they often involve targeted policy objectives and obligations on the part of the recipient that "would likely require detailed contracts or understandings between government and firms, potentially more intrusive and more dependent upon bureaucratic control or monitoring of firm behaviour" than instruments that are not target oriented (Howse 1993, 475).

As mentioned before, communitarians may support employment maintenance programs, especially in one-industry towns, as a mechanism for preventing labor dislocation and a fracturing of the community. However, as Trebilcock, Howse, and Chandler note, "production subsidies have served undoubtedly to postpone community disruption from large-scale job losses, but having come later rather than sooner in many instances these disruptions have been all the more traumatic and severe" (1990, 108).

Tax Expenditures

Tax expenditures, which are described as departures from the normal tax structure, include tax exemptions where "some part of an income or action is exempted from taxation"; tax writeoffs, where "some expenditures can be deducted from taxable income"; and tax credits whereby "the treasury gives a sum of money to those taxpayers who contribute to some cause deemed worthwhile by the government" (Bemelmans-Videc 1998, 45).

Tax expenditure is contentious, both as a term and as a concept. According to Bruce, the term is controversial because it implies that the funds forgone by the revenue authorities are comparable to budgetary expenditures, which, in turn, implies that government has a prior claim on taxpayers' income. The concept is controversial because it assumes a normative benchmark — one must have some idea of a normal or ideal tax system to describe departures from this system (see Sargent 1988, 18; Bruce 1988, 22–26).

Numerous kinds of tax expenditures exist, and some can be used to combat economic shocks. Many jurisdictions make tax credits available for charitable donations; thus, taxpayers receive a fixed rebate for each unit of currency they donate. Since many charitable causes involve natural disasters, one can argue that tax credits serve as an incentive for people to help the victims of such disasters.

Tax expenditures may also be used to reward firms that engage in energy conservation or that maintain safe workplaces. Investments in research and development and training programs for workers, aimed at improving firms' international competitiveness and viability in the face of impending trade liberalization, deregulation, or privatization, can be encouraged through tax expenditures on such investments and programs. Consider, however, that tax expenditures generally benefit entities with a positive income. Firms suffering net losses are unable to receive such benefits and, without assistance, may be unable to enhance their viability before the increase in international competition stemming from government changes in policy. The consequent failure of such firms would result in unemployment and dislocation.

Advantages. Tax expenditures are a popular choice politically. Unlike subsidies, "they are disguised on the revenue of the federal budget and do not show up in outlays" (Salamon 1989, 18). As a result, tax expenditures are likely to garner more public support "because of the public perception that they do not involve government spending" (Maslove 1994, 180).

Tax expenditures may also be popular among the beneficiaries of government incentives and among libertarians in general. Woodside notes that, among the reasons

> private businesses have preferred to receive public assistance through the use of tax expenditures instead of through the use of expenditure subsidies are the greater autonomy they thereby retain and the more limited accountability and interference this instrument involves between the user and the civil servants and treasury officials. (Woodside 1998, 164.)

Libertarians may support this lack of government control in contrast to direct spending programs (McDaniel 1989, 171).

Disadvantages. Critics of tax expenditures often argue that they are inefficient and ineffective as a policy instrument. Grabosky notes that the involvement of the tax department in programs that would otherwise involve only, say, the environment department, "may pose problems in terms of efficiency and oversight" (1995, 268). Such divided authority may produce confusion in the establishment of national priorities and difficulties in budgetary control (Surrey, cited in Stone 1980, 258). Moreover, "because tax regulations are developed and administered by the IRS [US Internal Revenue Service], which brings to the task an essentially tax orientation rather than a program orientation, programmatic goals can easily be subverted and opportunities for program coordination lost as the IRS seeks to maximize its revenue collections rather than the substantive goals of the tax expenditure 'program'" (Salamon 1989, 18). In addition, because tax expenditures are less visible and less subject to scrutiny, it is often difficult to assess their cost effectiveness (Surrey, cited in Grabosky 1995, 257). From a Rawlsian perspective, tax expenditures in the form of deductions are inimical to the goal of benefiting the least advantaged. Deductions "operate regressively; they are worth more to the wealthy than to the poor, and they are of no benefit at all to those outside the tax system entirely....Indeed, the promise of tax relief is of little comfort to a firm which is already operating at a loss and whose managers may be more concerned with survival than with regulatory compliance" (Grabosky 1995, 270). Some individuals and sectors simply may not have taxable income — an example may be farmers during periods of low prices — who consequently do not benefit from the use of tax expenditures, whereas those with the highest taxable incomes may receive the most benefits (McDaniel 1989, 180).

Symbolic Rewards

Another kind of positive incentive is symbolic rewards, which do not involve any monetary awards but are "limited to formal recognition often accompanied by some kind of token, such as a medal or trophy" (Grabosky 1995, 257). For example, in contrast to symbolic punishments, government agencies might choose to publish the names of firms that excel in the construction of disaster-proof buildings, that are proficient at meeting conservation targets aimed at preventing the depletion of nonrenewable resources, or that are innovative in finding methods of preventing workplace hazards and disasters. Should such positive publicity cause enough consumers to alter their behavior, the firms listed might receive an increase in business. This shift would, in turn, result in spillover effects in the prevention of economic shocks because more individuals would choose to do business with such firms, thus reducing the risk of losses due to natural shocks and the shock of resource depletion.

Advantages. From an efficiency perspective, symbolic rewards have the obvious virtue of being inexpensive. In addition, although they do not provide direct monetary incentives, their indirect material implications may induce individuals and firms to engage in desirable actions. As Grabosky notes, "symbolic rewards can have substantial instrumental value....The reputational capital which can be generated by an award may be worth a considerable amount" and may provide the firm with a competitive edge. For example, a firm that wins an award for effective energy conservation can use this fact in marketing strategies. Moreover, the publicity that may follow an award "can serve an educative function, raising public awareness about surrounding circumstances and focusing attention on critical issues" (Grabosky 1995, 261, 263).

Disadvantages. Since symbolic awards do not involve direct monetary incentives, they may prove to be insufficient in inducing desirable behavior (see Stone 1989, 213). For example, consumers may not react to symbolic rewards by providing the rewarded firm with increased business; they may instead rely on other consumers to do so, and a free-rider problem arises.

Ex Ante Communicative Instruments

Communicative instruments are tools used to influence the behavior of individuals through the provision of information, knowledge, and reasoned arguments. The information dispensed may concern the nature of the problem at hand, how people are actually handling it, measures that can be taken to change the situation, and reasons people ought to adopt these measures (de Bruijn and Hufen 1998; Cassils 1991).

Advantages. Information that is imperfect — due to extensive costs, for example — is a source of market failure that can result in inefficient outcomes. For example, it is "plausible that imperfect information may cause sub-optimal health and safety in the workplace" (Dewees, Trebilcock, and Tuohy 1983, 325). Communicative instruments seek to remedy such market failures and are promoted by economists and libertarians because they are market-supporting remedies that "allow individuals to better assess the true costs and benefits of their behaviour" (Tuohy 1989, 192). In addition, libertarians favor such remedies because they are among the least interventionist of policies, allowing individuals, such as employees in workplaces with disclosed hazards, to make their own decisions. They may choose to leave the firm or continue employment under the unsafe conditions, while demanding greater pay as compensation for incurring such risks.

An efficiency argument in support of communicative instruments is that they may be less costly to administer than other policy tools. Information dissemination does not require administrative procedures that are as extensive as the issuance and enforcement of a standard (Harter and Eads 1985, 255). In addition, one of the goals of information provision is to persuade and, as Tuohy notes, "persuasion (if successful) involves the internalization by the individual of standards of conduct and social objectives, [thus] continuing monitoring and enforcement costs are lowest of all in this type of compliance mechanism" (1989, 191). Information policies are also advantageous politically because "they do not necessarily impose great costs on concentrated interests such as individual producers, and therefore may meet less resistance than direct regulation" (Dewees, Mathewson, and Trebilcock 1983, 31).

Finally, distributive justice advocates can justify communicative policies because they may seek to provide information specifically to "poor people and owners of small businesses, both disproportionately affected by adversity and having less to spend to find out how to reduce it" (Balch 1980, 45).

Disadvantages. Tuohy notes that the start-up costs for communicative policies "may be relatively high, since each individual must be instructed, trained, debated with, or otherwise persuaded" (1989, 191). It may also be costly for individuals to "gather, interpret, and utilize...information once it is provided" (Dewees, Mathewson, and Trebilcock 1983, 30). Although the provision of information is likely to be relatively inexpensive, the desirability of communicative policies is still questionable because their effectiveness is largely uncertain. Dewees, Mathewson, and Trebilcock note that the effect of information provision may be quite limited because the onus is on individuals to "invest their time in seeking and judging the information supplied," and only a small minority are likely to expend this energy (ibid., 28). Even if private actors bother to take advantage of communicative tools, they may not have the "analytical tools available to them to interpret the information in light of their particular utility functions, including risk preferences," and thus, disclosure requirements may be rendered ineffective (Trebilcock 1998, 10). In addition, even if private actors are able to process the disclosed information, they may be unable to effect a change. Moreover, they may be unwilling to act; "the provision of information does not always lead to change in behaviour" (de Bruijn and Hufen 1998, 19). For example, individuals who are given information about the significant probability of a natural shock or a government taking in their immediate area may nonetheless be unwilling to relocate because they may anticipate future compensation.

Government-Provided Information

Government may choose to provide the information in question directly, especially if it "is of a public good nature." Counting on firms or individuals to engage in such research would be costly and inefficient (Dewees, Mathewson, and Trebilcock 1983, 338), and many might remain ignorant of certain realities. For example, government may undertake research and provide information about the probability of specific natural disasters in order to discourage movement into a disaster-prone area, encourage movement out of it, or encourage the purchase of private insurance. With regard to workplace hazards, Harter and Eads suggest that there "might be cases where the mere publication of information about a hazard would be sufficient to change current industry practice" (1985, 255). Hence, government can seek to stem losses resulting from corporate mismanagement of workplace safety through the provision of information.

Mandated Information Disclosure

Instead of providing information itself, government may choose instead to compel private parties to disclose it. Dewees, Mathewson, and Trebilcock note, for example, that government could require firms "that hire employees to work in hazardous workplaces to warn those subjected to these risks of the nature of the risks" (1983, 338).[1]

By mandating the research and disclosure of information, however, government may, in fact, be imposing large costs on private parties. Forcing compliance with such policies may have a greater adverse effect on small firms than on large ones. Thus, such a policy instrument may garner the opposition of advocates of distributive justice. A solution would be for government to subsidize the research and dissemination of information.

Subsidized Information

Government "could subsidize, through contracting out, the provision of...information by various community organizations or private for-profit firms" (Trebilcock 1995, 11). Such a policy would alleviate the cost burden of information disclosure faced by private actors. For example, government could provide funds for the collection and publication of accident and injury rates by industry (Harter and Eads 1985, 227) to induce the efficient development of public and private policies geared to the prevention of corporate mismanagement of workplace safety. Such information could assist government agencies in setting the appropriate level of injury tax to charge companies.

Government could also subsidize certain organizations to investigate the effects of a policy of trade liberalization — for example, by researching the number of potential international competitors in a particular sector and the characteristics of the respective firms. The publication of such information could assist domestic firms in planning strategies to compete domestically and internationally should government adopt a policy of trade liberalization.

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[1] An example of mandated information disclosure is Canada's Workplace Hazardous Materials Information System (WHMIS). For WHMIS-"controlled products," the federal and provincial governments mandate cautionary labeling of containers, provision of material safety data sheets, and worker education programs.

Ex Post Command-and-Control Instruments

Government may seek to alleviate the effects of a shift in comparative advantage and prevent labor dislocation by imposing protective tariffs and import quotas in certain industries. *Tariffs* are taxes a government imposes on either exports or imports, most commonly imports; quotas are government-mandated limits on either the quantity or the value of trade in a product (Husted and Melvin 1995, 182).

Advocates of economic efficiency generally oppose such protective methods for their ineffectiveness and inefficiency. Pearson and Salembier note that, "[u]nless the government can correctly identify which industries will ultimately become competitive and which will not, trade protection gives confusing signals and often fails to promote efficient allocation of resources" (1983, 20). Moreover, tariffs and quotas have been extremely costly to consumers and the general public (see Trebilcock, Howse, and Chandler 1990, 55). For example, in the United States, voluntary export restraints in the automobile sector are estimated to have cost consumers US$105,000 to $241,235 per job saved. In Canada, the estimates range from C$179,000 to $207,166 per job saved (ibid., 67). The agricultural sector has also received trade protection that has resulted in large costs to domestic consumers. "In the early 1980s, non-farm households in Western Europe and Japan were each taxed the equivalent of between [US]$800 and $1,700 per year, primarily in the form of higher prices for farm products" (Anderson and Tyers 1991, 50). Consequently, utilitarians are likely to oppose trade protection because it may benefit a few in the protected industry at the expense of a large number of consumers, producing a net decline in aggregate social welfare. On the other hand, proponents of Rawlsian distributive justice may support such policies because they often benefit disadvantaged low-skilled workers in declining labor-intensive industries. Communitarians may also favor trade protection to prevent job loss, especially in one-industry towns, in order to avoid labor dislocation and the disruption of community ties.

Overall, studies show that the use of tariffs and quotas in declining sectors, such as the textile and clothing industries, has failed to prevent substantial job loss (see Trebilcock, Howse, and Chandler 1990, 55). In addition, Collins notes, protection may not maintain overall industry employment because firms may undertake investments that shift production to more capital-intensive technologies or to other jurisdictions (1998, 37).

Ex Post Judicial Instruments

Civil liability, like criminal liability, serves a deterrent rationale. Law and economics scholars focus on the ability of tort law to provide appropriate incentives "for the various causative contributors to a given negative outcome...to minimize the sum of accident and avoidance costs by taking cost-justified precautions to reduce the likelihood and severity of that outcome" (Trebilcock 1989, 471–472).

In addition, there are *ex post* corrective justice and communitarian rationales for the promotion of civil liability. Scholars of corrective justice believe that "a person whose morally culpable behaviour has violated the equal individual autonomy of another [has] an obligation to restore the latter as nearly as possible to his or her pre-interaction status" (ibid., 472). Thus, civil liability is a desirable instrument with respect to corrective justice because a successful plaintiff receives compensation from the injurer defendant for harm suffered as a result of the latter's actions. In contrast, financial penalties for criminal liability are usually paid to the treasury, not to the victims (see Ogus 1998, 775). Some communitarian scholars advocate an expansive conception of tort law because they believe that accident costs should be shared collectively in order to spread the risk inherent in activities, such as manufacturing, that "an industrialized, interdependent society has collectively decided to embrace"; thus, the tort system is seen as a "form of social insurance" (Trebilcock 1989, 472, 477).

Under a corrective justice rationale, the victims of mismanagement — whether corporate or public — can use the tort system to attempt to gain compensation for their losses from the doers of the harmful acts. In addition, some communitarians may advocate use of the tort system to compensate workers who are injured from their exposure to product safety risks in order to prevent the burden of such risks from being concentrated on a certain segment of the population.

As already mentioned, however, the tort system is complex, and issues of causation may be difficult to prove. Moreover, individuals who are newly unemployed due to a mismanagement shock, corporate or public, may not have the expertise, money, or energy to invest in civil litigation.

Ex Post Incentives

Several of the *ex ante* policy instruments discussed above can also be used to some extent as *ex post* policy instruments. For example, subsidies may be provided to individuals and small businesses to help them cope with losses produced by natural disasters.

A whole series of instruments, such as subsidies, tax expenditures, and symbolic awards, may be used after an oil price shock to limit the use of oil, promote energy conservation, and encourage the development and use of alternate energy sources and energy-saving products.[2] Subsidies and loans could be provided to alternate domestic energy industries, such as natural gas producers, and to companies promoting products that conserve energy. In addition, as noted before, symbolic awards could be bestowed on firms that are successful in meeting conservation targets.

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[2] During the oil crises, for example, taxes were imposed on energy-consuming cars (Dewees, Mathewson, and Trebilcock 1983, 36).

In addition, Cline suggests, tax credits could be made available for college study such that a larger segment of the population can survive and benefit from the changing structure of comparative advantage, which in North America has emphasized knowledge-based industries (1997, 273).

Subsidized Loans and Loan Guarantees

A *subsidized loan* is one offered to beneficiaries at interest rates set below the market rate (Cassils 1991, 11). A *loan guarantee* "is an agreement by the government to cosign loans on behalf of eligible borrowers" (Lund 1989, 125). Such programs can serve as compensation to individuals and businesses that suffer losses from economic shocks.

Subsidized or guaranteed loans can be provided to individuals to help them relocate away from areas damaged by natural disasters.[3] In the past, subsidized loans have been provided to small businesses that suffer losses from natural disasters. Given that such disasters generally affect numerous entities simultaneously, the evaluation and approval of loans may be severely drawn out and, consequently, the distribution of much-needed funds delayed. Any increase in the number of loan personnel would, in turn, make the program more costly.

Loans may also be made available to firms adversely affected by increases in the prices of inputs, such as oil, to assist them in energy conservation. Government may, however, find it difficult to monitor whether such funds are actually being used to develop resource-conserving technology.

Subsidized loan programs to farmers were originally instituted to correct their perceived inadequacy of access to credit (Bemelmans-Videc 1998, 193), but additional rationales have since emerged. One is the need to promote income stability; farmers are particularly vulnerable to fluctuations in their income due to the international interdependencies of the price and demand for agricultural goods.

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[3] Indeed, they could also be provided *ex ante* to induce people to relocate prior to a potential natural shock.

Advantages

Like tax expenditures, loan programs may be popular politically because of their apparent costlessness: "[S]ince loan guarantees do not require initial monetary expenditures from government, they are not listed in the federal budget as outlays, thus avoiding the need for unpopular increases in the budgets or taxes." Loan programs are also less likely to be the target of political opposition because they are "not outright handouts despite the substantial subsidies often involved" (Lund 1989, 129, 130). Moreover, since these loans are not outright handouts but must be paid back, it may be possible to avoid some of the disincentive problems associated with welfare payments discussed later.

From a distributive justice perspective, loan programs may be beneficial because they encourage the provision of loans to individuals and firms that might otherwise be unable to qualify as borrowers because they fall into high-risk categories. Those most likely to fall in those categories are low-income individuals, small businesses, and members of less-advantaged communities. Hence, the program may benefit the disadvantaged; indeed, evidence exists that loan guarantees tend to favor less well off communities (ibid., 156).

Disadvantages

An efficiency argument against loan programs is their potentially costly nature. Lund notes:

> While loan guarantees generally appear to be somewhat more cost-effective compared to other tools used for similar purposes, they are less efficient than is widely assumed because of a number of subsidies and other costs that are not always recognized and have been little studied. (1989, 153.)

For example, government may offer lenders direct outlays, tax expenditures, or other subsidies as incentives to participate in loan programs. A more substantial cost involves the problem of moral hazard. Government agencies rely on lenders to gather and assess relevant information regarding loan applicants, but since "an agency's guarantee shields the lender from the risk of financial loss, there is less incentive than with normal commercial loans to discriminate creditworthy from risky applicants; whether the borrower repays the loan or defaults, the lender's returns may be approximately the same" (ibid., 149). Consequently, loans have been awarded to poor risks who are likely to default. In addition, Lund reports evidence suggesting that lenders also "give low priority to the loan servicing tasks," such as collecting repayments when due and monitoring accounts for potential defaults (ibid.). Moral hazard occurs not only with private lenders but also with borrowers. Individuals and businesses may be less diligent and productive in their activities and investments, knowing that their loan is guaranteed by government.

From a Rawlsian perspective, loan programs may benefit the less well off, but they are unlikely to benefit the least advantaged because of repayment expectations. Lund notes that the "evidence suggests that beneficiaries of guarantee programs generally come from middle and lower middle economic strata," and the poorest social groups or communities "are not much helped" (ibid., 155).

Subsidized Insurance

Government may offer insurance, subsidized in the form of lower premiums, to induce individuals and businesses to carry insurance that would mitigate losses from various economic shocks.

An efficiency argument against the goal of encouraging individuals and firms to carry insurance is that of moral hazard: "A moral hazard problem exists when individuals are encouraged to engage in high risk activities because they are protected from the consequences of their actions" (Pasour 1990, 173–174). Moreover, Pasour notes: "[I]nsured individuals may deliberately suffer a loss or avoid adequate precautions to collect insurance benefits. For example, with respect to crop insurance, farmers with bad prices may collect benefits by setting fire to a field or by neglecting to protect the crop from pests" (ibid., 174). With subsidized insurance, those who are insured do not bear the full costs *ex ante* of such moral hazard and thus may have limited incentives to avoid it.

Ogus notes the existence of "evidence that individuals tend to overestimate risks associated with low-probability events and underestimate those arising from higher-probability events" (1994, 152). Hence, individuals are more inclined to insure against low-probability catastrophic events than against less severe high-probability events. As a result, using subsidies to encourage private actors to purchase insurance for generally underinsured events could greatly reduce the losses of victims from natural shocks and, in turn, the costs borne by taxpayers in funding disaster relief programs. However, moral hazard may be a problem; for example, individuals may be more likely to settle in a disaster-prone area when they are aware that they do not bear the full costs of insuring losses. Subsidized insurance for potential takings would also run a similar risk of habitation and overdevelopment of land likely to be taken by government.

Job-Search Subsidization

Government can assist unemployed workers who have been displaced as a result of market shocks such as changes in technology, shifts in comparative advantage, or corporate mismanagement, or as a result of government shocks such as trade liberalization, deregulation, and privatization. One method of aid is to subsidize job-search facilities that collect and post job listings, as well as offer counseling and advice on jobs, careers, education, and skills development (see Bernstein and Trebilcock 1996, 30).

From efficiency and utilitarian perspectives, this policy instrument may be beneficial because it is designed to provide information to displaced workers to help them find new employment. Society as a whole may benefit from a more efficient allocation of labor. Proponents of distributive justice may also support such a policy instrument if the displaced workers who are served include the least advantaged, socially or economically. In addition, a communitarian rationale favors job-search subsidization. Since communitarians believe in the sharing of burdens, they find it appropriate that the rest of the community aid displaced workers — for example, through the allocation of taxes to job-search facilities.

Jacobson argues that, in mitigating the shock of unemployment, job-search assistance is more effective than training because it is effective in "reducing the time out of work. In contrast, training usually lengthens unemployment, and a key cost of training is foregone earnings" (1998, 507). In addition, job-search assistance is relatively inexpensive, "costing from one-third to one-tenth less than training. As a result, government programs relying on [it] can serve three to ten times as many people as training programs with the same amount of funds" (ibid., 507–508).

Relocation Assistance

Government can assist workers unemployed because of economic shocks, especially those displaced in one-industry towns, by helping them to relocate to higher-growth and more diversified regions. Such transfers result in a more efficient allocation of labor resources. They do, however, produce disruptions in communities. Moreover, Bernstein and Trebilcock note, workers often find it difficult to relocate because of financial constraints and emotional ties to their current place of residence (1996, 27). Government can intervene and provide financial assistance to help unemployed individuals cover the expenses of moving and resettling, as well as subsidize counseling services in an effort to help individuals adjust to the move.

Efficiency and utilitarian rationales provide support for relocation assistance to those who would otherwise be unable to move due to financial constraints, because such assistance may induce the reallocation of labor to more efficient uses in more productive areas. From a Rawlsian perspective, such a policy instrument is desirable if the displaced workers who are served include the least advantaged. Communitarians may disapprove, however, because the primary goal of relocation assistance is the facilitation of labor relocation, a goal that runs counter to communitarians' desire to maintain existing social ties and prevent community fragmentation.

Government could also provide relocation assistance to victims of natural shocks who are forced to move, temporarily or permanently, due to the destruction of their property or of the community at large. Such policies might not evoke opposition from communitarians because individuals whose homes had been destroyed would have no choice but to relocate, at least temporarily.

Training Programs

Government can play a role in establishing or promoting training programs, on the job or in the classroom, to help workers learn the skills they need to operate new machinery and instruments and to develop the skills they need to survive in a knowledge-based economy. Thus, training can help to facilitate an efficient reallocation of workers from declining labor-intensive manufacturing industries, such as textiles and clothing, toward growth sectors, such as services, technology, and knowledge industries. Training can also satisfy distributive justice rationales by enabling workers to acquire the skills they need to take advantage of the gains from increased trade, rather than suffer losses from it.

From efficiency and utilitarian perspectives, scholars such as Gunderson advocate active policies of training and retraining that "encourage labour reallocation from declining to expanding sectors" (1993, 3, 37), resulting in allocative efficiency and an enhancement of social welfare. Some training programs focus on the training and certification of segments of society — such as young people and older unemployed workers — who are likely to be less skilled and to have greater difficulty in finding new employment (see Huckemann 1995, 49). Hence, distributive justice also provides justification for specific training and retraining policies.

And communitarians are likely to support training programs because of their belief in solidarity, the need to share burdens, and the civic duty and obligations of citizens to assist fellow members of the community who have been adversely affected by economic shocks.

Despite these advantages, the effectiveness of training programs may be questionable. First, there is no guarantee that individuals will voluntarily take part in them. Training can be made mandatory — by, for example, linking it to the receipt of income maintenance transfers — but libertarians criticize such a remedy as imposing constraints on choice and infringing on autonomy. Second, government may choose to subsidize firms for the provision of on-the-job training, with the policy goal that trainees be taught skills that are portable in the economy (Howse 1993, 477). As Donahue suggests, however, such a policy goal may not be realized as "the employer is better off training workers in strictly firm-specific skills" (quoted in Howse 1993, 477). And as Komesar points out, "firms may be reluctant to train workers because they cannot appropriate the full returns as other firms may simply bid away the trained workers" (1994, 15).

Overall, government-sponsored job training programs have a record of efficacy that is poor to mixed in finding secure, well-paying jobs for displaced workers (Bernstein and Trebilcock 1996, 95–99).

Government must also walk a fine line in the provision of training programs because, on the one hand, intervention may be beneficial in solving the free-rider problem, in which firms are reluctant to provide training because they fear that other firms will bid away trained workers. On the other hand, intervention may be wasteful if firms would have conducted training themselves in the absence of government involvement.

Ex Post Compensation Programs

Faced with economic shocks, government can provide citizens with various compensation programs. They include income maintenance programs, special income benefits, and equalization payments from the central government to badly off regions, states, and municipalities.

Income Maintenance Programs

An example of a Canadian income maintenance program, designed to provide transitional assistance to displaced workers, is employment insurance, which is financed through both employee and employer contributions (see Trebilcock et al. 1982, 64). Assistance is provided to the unemployed "regardless of the specific cause of dislocation" (Trebilcock, Howse, and Chandler 1990, 131).

Income maintenance may create inefficient work disincentives by making the cost of leisure (nonwork) cheaper (see Myles 1996, 17; Bernstein and Trebilcock 1996, 25). Consequently, the program can work against the market forces that encourage adjustment from declining to expanding sectors (see Gunderson 1993, 3). Nonetheless, income maintenance may be beneficial in the short term as a temporary social safety net for displaced workers during the period between losing their jobs and finding new ones. Moreover, as Gunderson notes, "unemployment insurance can facilitate productive job search" (ibid., 38).

Holders of a Rawlsian perspective are likely to support income maintenance programs because they provide financial aid to those among the least advantaged, socially and economically. Communitarians may also favor income maintenance because it prevents disruptions to the community by, for example, rendering relocation unnecessary. Gunderson notes, however, that such programs "run the risk that they discourage adjustments at the margin and thereby simply postpone the adjustments that are more costly and disruptive when they occur inframarginally" (ibid.).[4]

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[4] Marginal adjustments include a reduction in hours, attrition, and firm transfers, whereas inframarginal adjustment involves mass layoffs and plant closings, which are exceptionally disruptive to communities.

Special Income Benefits

In addition to unemployment insurance, some countries have set up "additional benefit programmes...for some subsets of workers dislocated by long-term structural change" (Trebilcock, Howse, and Chandler 1990, 132). Communitarians are likely to support these programs because they entail a sharing of burdens; so are advocates of distributive justice if displaced workers who receive benefits are among the least advantaged. From an efficiency perspective, such benefits are unlikely to be supported as a long-run strategy, as they may result in disincentives to recipients' redeploying their labor.

Most such programs are established to assist displaced workers and industries that have suffered losses as a result of trade liberalization and shifts in comparative advantage. Salembier, Moroz, and Stone assert that these "narrowly focused programs are quite effective in providing transitional income support to displaced workers." (1987, 207). Such assistance may, however, undermine the reallocation of labor in the direction of the shift in comparative advantage by providing disincentives for such shifts. In addition, Salembier, Moroz, and Stone note, it is "crucial to avoid wasteful over-compensation of displaced workers so as not to interfere with the group of workers at the margin of the labour force for whom incentives to adjust are sufficient without any assistance from government" (ibid.).

An important reason for special income benefits, according to Collins, is that displaced workers alone should not have to "bear the costs from structural adjustments that benefit the economy overall...[Thus,] [w]hen displacements can be attributed to government trade or other policy, some argue that fairness dictates compensation." The author asserts, however, that "the affected groups are difficult to identify, and it is not obvious that they deserve special treatment. An alternative and perhaps more defensible position calls for assisting all workers unlucky enough to lose their jobs involuntarily, regardless of the cause" (1998, 36). Nonetheless, distributive justice considerations may support special assistance for workers displaced from import-sensitive industries; Kletzer says that such workers "do appear to have more difficulty in finding new jobs," which may be due to the fact that workers in such industries are "more likely to be female, younger, and less educated" (1998, 39).

Government also provides victims of natural disasters with special income benefits through disaster payment programs. From an efficiency perspective, such a policy instrument may not be desirable because of issues of moral hazard. For example, disaster compensation paid to farmers may make it more likely that they will farm on "fragile lands" (Pasour 1990, 175) or that individuals will settle in disaster-prone areas. Similarly, governments may provide compensation to victims of regulatory changes intended to benefit the community at large. Again, problems of moral hazard exist as individuals may be induced to develop land likely to be taken, given the knowledge that special compensation will be made. In addition, individuals may then be less likely to anticipate legal changes and to engage in precautions to prevent losses from probable takings (see Levmore 1999).

Equalization Payments

In the Canadian case, the federal government extends to poorer provinces transfer payments funded by the general revenues of the richer ones. "The rationale behind these massive transfers is to ensure that all [citizens] can enjoy approximately the same level of government services without inordinate 'fiscal effort' having to be exerted by the governments of the poorer provinces" (Trebilcock et al. 1982, 64). Economists and utilitarians may argue, however, that this policy results in an inefficient allocation of resources by producing a disincentive for the movement of workers from depressed areas to high-growth areas. Conversely, efficiency criteria are sometimes used in support of equalization payments. Boadway and Flatters argue that free migration in a decentralized federal economy may lead to an inefficient allocation of labor because individuals are likely to base their migratory decisions on variations in provincial government fiscal spending on services and without regard to whether their skills and labor will produce greater value in the province to which they seek to migrate. The authors claim that this inefficiency can be eliminated by a system of interregional transfers, either voluntarily arranged by the provinces or imposed by the federal government, such that provinces would be able to provide equivalent services (1982, 621–630). Communitarians support such a policy as it promotes solidarity among all Canadians and prevents the disruption of communities by mitigating the need for individuals to relocate. Advocates of a Rawlsian perspective may also support such a policy because it involves transfer payments to the least-advantaged communities.

In addition to the sort of regular equalization scheme that Canada uses, countries may provide payments to assist specific regions that are disproportionately affected by an economic shock resulting from, for example, natural disasters such as a flood or tornado. Such transfers are transitional and should not involve concerns over disincentives for labor reallocation because long-term structural changes in output and employment do not necessarily follow from natural shocks. In contrast, transfer payments made to areas suffering from long-term structural declines in employment that stem from, for example, the closure of the fishing industry due to government mismanagement or the loss of the manufacturing base due to trade liberalization may produce disincentives to reallocate to other areas with greater employment possibilities. Nonetheless, communitarians still advocate equalization transfer payments in order to share burdens and prevent community disruptions.

Communicative Instruments

The information tools already described can be useful *ex post* instruments, in combination with compensatory schemes, because they can inform victims of economic shocks about the services and transfers available to help them mitigate the adverse effects of shocks. In addition, in the case of price shocks, such as the oil crises, government can undertake research and disseminate information about different methods of conserving energy to alleviate the shock of massive price increases.

Conclusion

As this chapter demonstrates, government can use a broad range of policy instruments to intervene in the face of economic shocks. *Ex ante* policy instruments are directed toward preventing or mitigating a potential economic shock, whereas *ex post* policy instruments are aimed at mitigating a shock that has already occurred.

Just as the justification for intervention of any kind depends on the normative framework within which one approaches the question, so too the optimal policy tool depends on the normative justification for intervention. For example, subsidized loans to firms to rebuild after a flood may be rejected by efficiency theorists, who worry that businesses that anticipate such treatment *ex post* have less incentive to take care to mitigate the effects of flooding *ex ante*. Communitarians, on the other hand, tend to support policies such as loans for rebuilding that keep the flooded community intact. Proponents of distributive justice may support subsidizing the relocation of low-paid, low-skilled workers from an area depressed because of a market shock, while communitarians oppose encouraging the disintegration of the community. Advocates of distributive justice might endorse income support for low-paid, low-skilled workers displaced by trade liberalization, while efficiency theorists would be concerned about the disincentive to work, re-locate, or retrain that such support entails. In summary, the complicated question of whether to intervene at all in the face of an economic shock is made more difficult by the question of the form of intervention. The choice of instrument depends not only on the type of shock but also on the goals that government wishes to promote.

Having outlined the taxonomy of shocks, the range of normative rationales for intervention, the policy instruments available to government, and their interrelationships, we turn now to examining some examples of shocks. In the following chapters, we examine shocks that fall within each category of our taxonomy of shocks: natural shocks (floods); market shocks (the oil crises of the 1970s and agricultural price collapses); and government shocks (trade liberalization and apparent mismanagement of the East coast cod stock). These cases provide contexts in which to illuminate further the normative rationales for intervention and policy instruments, as well as some empirical evidence of the efficacy of intervention. In each case, we first outline the facts that demonstrate an economic shock. We also discuss the normative case for intervention, in each instance focusing on those perspectives that are most relevant to the shock in question. Finally, we describe actual and potential responses by government.

5

Natural Shock Case Study: *The 1993 US Midwest and 1997 Red River Floods*

Floods are among the most devastating forms of natural disasters. They are devastating in two respects: they bring about loss of life, displacement, and immense economic losses; and they recur in the same communities. To the extent that they recur, floods are predictable economic shocks that government and private parties can attempt to mitigate. As Tobin notes, "hydrologists and floodplains managers can now map floods and forecast peak flows with greater accuracy than ever before. As a consequence, most floods are no longer unexpected 'acts of God'; they follow predictable patterns and can be anticipated sometimes days or even weeks in advance" (1996, 120). The 1993 flood in the US Midwest and the 1997 Red River flood in North Dakota and Manitoba are examples of floods that were anticipated and prepared for, yet, because of their ferocity, produced much damage and loss.

The 1993 US Midwest Flood

In 1993, unusually heavy snow-melt, excessive and prolonged rainfall in the upper Mississippi River Valley and the Great Plains, and subsequent soil saturation combined to produce "one of the most damaging disaster events in U.S. history" (Tierney, Nigg, and Dalhamer 1996, 214). At their peak, the floodwaters covered approximately 20 million acres of land in nine states. The flood is estimated to have caused 52 deaths and property damage in the amount of US$12.7 billion to 70,000 homes and buildings, and to have left more than 74,000 people homeless (Changnon 1996a, 206; Wright 1996, 253). Total economic losses were approximately US$18 billion, the highest figure on record for any flood, and the "[g]reatest damage occurred in agriculture, transportation, and the commerce and industry along the major rivers," the Mississippi, the Missouri, and the Illinois (Changnon 1996a, 297). Glastris and Collins note, "[u]nlike the case of Hurricane Andrew, which mostly wiped out residences, the floods...hit income-producing farms and businesses" (1993, 37).

Although the flood-affected area contains only 10 percent of the US population, it supports nearly 20 percent of all farm employment. The flood destroyed 5.1 million acres of corn and 3.1 million acres of soybeans, the two primary crops of the region, which, in addition to the loss of farmers' homes, livestock, and farm structures and equipment, contributed to agricultural losses in the amount of US$8.9 billion — $2 billion in Iowa alone. An offsetting benefit was that many nonflooded Midwestern farmers came out winners as the flood caused grain prices to rise (Changnon 1996a; 1996c, 283–284). In addition, the rain itself benefited the wheat crop and corn harvest in other nonflooded areas, such as Kansas ("And the Waters Prevailed," *The Economist*, July 17, 1993, 23).

Within the transportation sector, the closure of the upper Mississippi River on June 26, 1993, rendered more than 2,000 barges idle for nearly two months and produced losses to barge companies in the amount of US$600 million (Changnon 1996c, 285). The barge industry comprises approximately 800 barge-tow owners (a few giant companies plus many small businesses with a few tows), shippers who rely on barges, and ports and terminals where loading and unloading occurs. In the St. Louis area alone, 3,200 workers who load, unload, and clean barges were temporarily left without work (Changnon 1996a, 184). Like agriculture, transportation had some "winners" emerge from the flood. As Changnon notes, "some truck firms benefited by getting an estimated [US]$13 million in additional business because the stranded barges could not transport the cargo" (ibid., 200).

Several days after the termination of barge activity, rail traffic was also brought to a standstill. Despite the efforts of railway companies to reroute train movements, raise lines, and rebuild washouts and bridges, "the damages and losses suffered by Midwest railroads ranked the 1993 flood as the worst natural disaster ever experienced by the U.S. railroad industry"; physical damage to railroads and revenue losses ran in the amount of US$240 million and US$169 million, respectively (Changnon 1996c, 286).

Furthermore, the interruptions in road and highway services resulted in "9,238 jobs lost in 81 communities in which people were unable to get to their jobs" (Changnon 1996a, 200). Others were rendered temporarily unemployed as businesses shut down, not as a result of property damage, but because of interruptions in "lifeline services," such as water, electricity, natural gas, sanitation, telephone, and the delivery of inputs and supplies (Tierney, Nigg, and Dalhamer 1996, 224). Des Moines, the Iowa state capital, experienced extensive disruption and loss from the flood, which hit the city in mid-July. The waterworks power plant flooded, and "[w]ith no water there could be no fire cover, and with no fire cover the mayor, John 'Pat' Dorrian, ordered all but essential businesses to shut" (Mairson 1994, 86). Some business owners found it difficult to recoup their losses after the temporary closures, and firms that depended on a steady cash flow had difficulty remaining viable (see Hauer 1996, 131; Tierney, Nigg, and Dahlhamer 1996, 216).

The 1997 Red River Flood

In 1997, "a combination of extreme natural circumstances, including high soil moisture, heavy winter snowfall and a major late spring blizzard" produced what was dubbed the flood of the century in the Red River Valley, first hitting North Dakota in mid-April and then spilling northward into Manitoba (Manitoba Water Commission 1998, v, 1).

North Dakota

North Dakota was severely affected: 40 percent of the state's economy directly depends on agricultural production, and close to 2 million acres of farmland were left submerged (Roberts 1997, A1; *The Economist*, April 26, 1997, 24). Forecasters had been predicting record high water for Fargo and Grand Forks. On April 13, the Red River crested at Fargo without producing excessive damage; by April 19, however, Grand Forks had been "virtually destroyed" (Bumsted 1997, 106–108). The floodwaters are estimated to have immersed 90 percent of the town and damaged 11,000 houses and commercial buildings, as well as the water plant — resulting in a loss of drinking water and electric power and forcing the evacuation of 50,000 town residents (*The Economist*, April 26, 1997, 24; Hurt 1998, 158; Roberts 1997, A1). In sum, the city of 55,000 lost its struggle with the Red River, and most observers now conclude that Grand Forks was devastated largely because of "a forecast that underestimated the depth of the approaching torrent by four feet, enough to drown the town" (Collison 1997, 22–25).

Manitoba

Downriver, Manitoba had more time to adjust forecasts of the impact of the flooding Red River and to prepare accordingly, but the damage was still considerable. In all, 28,000 Manitobans were evacuated from flood-risk areas, and 5,200 residences and businesses were damaged. The flood inundated "five percent of Manitoba's farmland — some 200,000 hectares...Most of that is grainland, but more than 150 hog producers and at least 16 dairy farms are also affected" (Came 1997a, 29–32). Milk production dropped 25 to 45 percent, and losses to dairy farmers were estimated at $1.3 to $2 million.[1] Other sectors of the provincial economy also suffered:

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[1] "Assistance fund created for Manitoba farmers," Canadian Press, May 8, 1997, on-line CP (cnews), from Internet website: www.canoe.com/flood/may8–assistance.html; accessed July 1999; Pindera 1997, 52–62.

"Closed highways affected truckers. Market gardeners could not open their fields. Merchants, golf course operators, real estate agents, and auto dealers all complained of losses" (Bumsted 1997, 128). More generally, an estimated "1,000 businesses closed their doors and laid off employees as a result of the flood" ("Flood aid flows in," *Canadian News Facts*, May 16, 1997, 5500–5501).

Hurt (1998) notes that the damage would have been worse, especially in Winnipeg, the provincial capital, were it not for the Red River Floodway, a 47-kilometer channel completed in 1968, which directs a portion of the Red River flow around Winnipeg during floods. Two nearby towns, Ste-Agathe and Grande Pointe, were the unfortunate exceptions to Hurt's observation. Ste-Agathe, a town of 500 on the west bank of the river, suffered much destruction as a "wall of water" rushed in from the unprotected side of the town, the side without a dike (Came 1997b, 17). Approximately 100 homes were destroyed as a result ("Flood aid flows in," *Canadian News Facts*, May 16, 1997, 5500–5501). And when the floodway gates were raised to allow more water into the diversion, the river inundated Grande Pointe, damaging 125 of the suburb's 150 houses, most of which had cost $200,000 or more to build (Bumsted 1997, 123). In sum, the "costs of preparing for the flood, flood fighting, damages and associated expenditures have been estimated at $500 million" (Manitoba Water Commission 1998, v).

Normative Rationales for and against Intervention

Most of the normative rationales described in Chapter 3 could apply in one way or another to government intervention to ameliorate the economic shocks resulting from the two floods.

Economic Efficiency

As already discussed, justification for government intervention may lie in the fact that private insurance markets are imperfect in covering the risks of natural disasters such as floods. In the United States, few private insurance policies extend to flood damage (Glastris and Collins 1993, 37). In Manitoba, private flood coverage does not exist; "[t]he 1950 flood washed out the local insurance industry. Claims from homeowners and farmers dragged many firms under, and the province's insurers now refuse to offer homeowners on the Red's national flood plain any flood insurance."[2] Kunreuther and Roth assert that flood insurance is unmarketable privately because of adverse selection and high correlation (1998, 40). Government intervention, in the form of mandatory insurance, could overcome these problems since all individuals, including those facing lesser risks, would be obliged to purchase insurance, and the risk would be spread among all insured. Government provision of disaster insurance could also mitigate the effects of market failure, allowing risk-averse individuals to obtain insurance to cope with the risk of flood damage.

In addition, Tierney, Nigg, and Dahlhamer, in their study of lifeline service disruptions during the Midwest flood, note that, although "lifeline failures and outages probably contributed to more economic loss than did direct physical flooding of businesses, ...[b]usinesses that were not flooded but were forced to close due to lifeline outages were less likely to have their losses covered by insurance" (1996, 230). Businesses that are forced to shut down temporarily because flooding has caused a lack of drinking water or electricity are unable to find any private insurance to cover such pure economic losses. Private flood insurance for farmers is also a rarity. As Kevin Neiles, president of Manitoba's Insurance Brokers' Association, notes,

> a substantial proportion [of farmers] don't have special flood insurance to cover the devastation of their livestock and equipment by floods. Such insurance is particularly expensive, and isn't usually included in the cheaper "named perils" policies that farmers hold.

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[2] "Ditch in time," *Globe and Mail* (Toronto), April 29, A18.

He also notes that homeowners have instead adjusted to the outright private insurance exclusion and anticipate government compensation instead.[3]

One can also make efficiency arguments against government flood relief. As discussed in Chapter 2, Kaplow (1986, 529–531) and Priest (1996, 30) both assert that government disaster aid is undesirable because it excuses investors from internalizing the full social costs of investing, developing, or settling in flood-prone land and produces perverse incentives. Salholz and Springen note that "the inevitable availability of federal assistance arguably saps the willingness of communities to prepare for disaster" (1993, 23). For example, individual farms in the Red River towns of Morris and St-Jean-Baptiste, Manitoba, were severely inundated, and it was not clear that anyone had even tried to build a dike; on other farms, inadequate and shoddy dikes were ineffective in preventing flood damage (Gray 1997, A1). Moreover, Priest notes, studies of the 1993 US flood demonstrate "sustained and repeated losses from 'disasters,' year after year in the same counties or states" (1996, 30). Tom Szilaszi, a building commissioner in St. Charles County, Missouri, was quoted in *Newsweek* (August 2, 1993) as saying, "[t]axpayers have bought some of these people refrigerators and chain saws 10 times over" (Turque 1993, 24–25). Problems of moral hazard may abound as people continue to rebuild and develop in flood-prone lands with the awareness that government will intervene. For example, *The Economist* asserts:

> The Mississippi flood-plain has been developed, in effect, on the back of federal insurance schemes. People have taken the risk of living there, and farming there, because they know the government will help them out if disaster comes. Premiums for both crop and flood insurance are kept artificially low. In individual towns and cities, 75 percent of the cost of flood control is met by the federal government. Even the remaining 25 percent is haggled over. Davenport, Iowa, would not build a flood wall because it

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[3] Quoted in "Ditch in time."

> did not want to spend money and liked its view of the river. Hannibal, Missouri...would not pay for flood control in residential districts. Both towns now lie under several feet of water. ("And the Waters Prevailed," *The Economist*, July 17, 1993, 23–24.)

Libertarianism

Because libertarians advocate a minimal state role, they are likely to reject government compensation for natural disasters such as floods. Instead, they believe individuals who choose to live in risky areas should assume responsibility for their choices. According to Salholz and Springen, relief experts asserted that victims of the 1989 San Francisco earthquake had been "flirting with disaster when they chose to live on the fault line"; the authors also note that "the same argument has been made about people who build...on the banks of the mighty Mississippi" (1993, 22–23). William Koeliner, chief of the water-control section of the Army Corps of Engineers in Rock Island, Illinois, states, "[i]f you're going to live near the river, you have to take precautions" (quoted in ibid., 23).

The libertarian argument that individuals have to take responsibility for the consequences of their actions was commonly made about both the 1993 US Midwest and 1997 Red River floods. Wilkins, in a discussion of the 1993 flood, notes, "[i]f private owners are unwilling to accept limits on unsafe building practices in known hazardous areas, why should the nation hold them harmless from the results of their own free choice?" (1996, 264). After the 1997 Red River flood, Manitoba Premier Gary Filmon asserted: "At some point, we have to ask, 'Where does personal responsibility come in locating your home next to a river that floods frequently?'" (quoted in Came 1997, 29–32).

In place of government intervention, libertarians advocate private mitigation, such as was the case during the Midwest flood, when the railway sector suffered severe property damage. The industry attempted to mitigate losses to revenue by working feverishly to raise lines, rebuild washouts and bridges, and restore operations, in addition to re-routing more than 2,870 trains (Changnon 1996a, 192, 195). Despite considerable efforts, however, the industry still suffered severe economic losses.

The only form of assistance acceptable to many libertarians is private charity, but in practice, such assistance has limits. After the Midwest flood, volunteers assisting in the cleanup "helped end the misery and got businesses running sooner,...[but] disaster specialists expect volunteer burnout, as the frenzy gives way to fatigue" (Sieder 1993, 37). Private charities were an important element of assistance — the Red Cross received more than US$10 million during and after the Midwest flood (ibid.), and in Canada more than C$13 million was raised through agencies such as the Red Cross and Salvation Army to help victims of the 1997 Red River flood (Thomson, MacDonald, and Sandrel 1997, 117). Nevertheless, as Bumsted notes, like all flood funds since 1950, the money raised in 1997 was used chiefly to supplement, not to supplant, government assistance, as most libertarians would have preferred (1997, 130).

Distributive Justice

Since utilitarianism advocates the distribution of resources in a manner that maximizes aggregate utility, it may or may not provide a rationale for government intervention. If flood victims receive government assistance and hence an increase in welfare, does the increase exceed the disutilities suffered by the larger group of citizens who are forced to fund the program through higher taxes? Similarly, does the government-assisted ability to continue to engage in risky activities produce utility on the part of the recipients that is greater than the disutility among other taxpayers who fund their undertakings? For example, some commentators argue that,

> although floodplain agriculture may be profitable from an individual farmer's point of view, no one really knows whether it is sustainable and cost-efficient from a national perspective. This is because the economic analyses do not count the full costs of sub-

> sidies, opportunities foregone, and environmental effects. (Sparks and Sparks 1994, quoted in Wilkins 1996, 264.)

Although utilitarians may argue against it, government intervention may still be justified under a Rawlsian perspective, which supports policies that benefit the least advantaged. Some may argue that farmers and other workers in the agricultural industry are disadvantaged because they are vulnerable to crop destruction caused by natural disasters and to price volatility, both of which can result in drastic fluctuations in their standard of living. As we noted at the outset of this chapter, the 1993 US Midwest and 1997 Red River floods caused the destruction of many acres of cropland, in addition to the deaths of livestock and damage to farm equipment. Some advocates of the Rawlsian perspective may argue that compensation is warranted in order to assist farmers and others in this unstable industry; others may consider that those workers are not among the least advantaged.

Sectors of the economy other than agriculture suffered flood losses due to the suspension of business. An example is the US Midwest barge industry, a large part of which consists of small businesses that are likely less able than larger enterprises to afford even short-term closures. One could advance a distributive justice rationale here for assisting small businesses recoup their losses and remain viable.

In addition to causing business losses, the US Midwest flood rendered 74,000 people homeless. A history of flooding in these plains has driven down property values, with housing in low-lying regions available at prices below US$25,000 (see Mairson 1994, 69; Wilkins 1996, 224). "As a result," Tobin points out, "lower-income households, elderly couples, young families, people on assistance, and mobile-home dwellers often inhabit floodplains. The downside is that such demographic groups, with limited or fixed incomes, are often the least able to cope with the financial losses that accompany severe flooding" (1996, 155). From the perspective of distributive justice, government intervention — for example, in the form of subsidized insurance or relief payments — is justified in such circumstances. Bumsted notes that, during the 1997 Red River flood, "[m]ost of the sandbagging was done in the more affluent parts of greater Winnipeg" (1997, 113), leaving poorer areas more vulnerable to damage and destruction and providing a distributive rationale for compensation.

Corrective Justice

Corrective justice can serve as a rationale for compensation in cases of public negligence. Government usually plays a key role in forecasting the extent of floods, and private parties base their precautions and preparations on these forecasts. After the 1993 US Midwest and 1997 Red River floods, however, government agencies were criticized for inaccurate water-level predictions, which led to inadequate preparations and, consequently, more extensive damage. Changnon notes:

> Assessments of impacts and responses to the [Midwest] flood revealed that much of the information made available was incorrect (often based on erroneous estimates) or was incomplete and failed to present all aspects of an issue. Much of this "misinformation" came from government agencies, the media,...and experts at universities and other institutions....[and] had detrimental effects on the decision-making of those industries seriously affected by the flood, including the barge industry. (1996b, 307, 309.)

He also asserts that "[h]ad the National Weather Service [NWS] been able to provide two or three weeks of advance warning about the flood's development, major changes in barge shipments could have saved shippers and barge owners millions of dollars because they could have moved equipment out of harm's reach" (Changnon 1996a, 203). In the case of the Grand Forks, N.D. flood, most observers now conclude that the NWS drastically underestimated the depth of the approaching torrent by four feet, enough to drown the town. By the time the agency began to revise its predictions, it was difficult for the town authorities or property owners to make adequate preparations or to move belongings to higher ground (Collison 1997, 22–25; Hurt 1998, 157, 160). Similar problems occurred in Grande Pointe, Manitoba, where, the Manitoba Water Commission reports, "poor forecasting results for this area left people ill-prepared for the flood" (1998, vii). It later became apparent that the forecasters had failed to take into account the effect of water levels at the floodway entrance (ibid., 78).

In short, in both the US Midwest and Red River floods, individuals and businesses suffered preventable losses by relying on information from government agencies that turned out be erroneous. It is uncertain whether the mistaken forecasts reflected negligence or merely the difficulty of making them. If they were made negligently, a corrective justice rationale may exist for government, the doer of the harm, to pay compensation to the sufferers for losses attributable to government negligence.

Communitarianism

Communitarians advocate a sharing of burdens and benefits and, in the case of natural disasters, contributions on the part of all members of a community to help affected parties. Such an argument was advanced in favor of compensation for residents of Ste-Agathe and Grande Pointe, Manitoba, some of whom have claimed that their towns were "sacrificed to save the City [of Winnipeg]," which escaped the 1997 flood largely unscathed due to the Red River Floodway (Manitoba Water Commission 1998, 7). As the Manitoba Water Commission reports, however, the operation of the floodway caused the water level in Grande Pointe to rise above its natural condition and flood the town, which had previously escaped damage (ibid., 69). In Ste-Agathe, the West Dike, a segment of the floodway, is said to have had the effect of increasing the flow through the town when floodwaters spilled over the Canadian National rail embankment (ibid., 56).

The Manitoba Water Commission reports that, in general, "residents understood and accepted the need to use the floodway to protect the city but felt strongly that they should be fully compensated for damages resulting from water levels being raised above 'natural'" (ibid., 6). Residents of other small towns also argued for compensation on the grounds that they had contributed to the building of the floodway and, consequently, to the safety of the capital, through the payment of rural tax dollars. As Jim Shapiro, a resident of St-Germaine, Manitoba, asserts, "[i]n a sense, I've protected them for years. Now it's time for them to assist me" (quoted in Thomson, MacDonald, and Sandrel 1997, 105).

Sharing the burden can also be justified on the grounds that natural disasters can create both winners and losers. During the 1993 US Midwest flood, farmers in nonflood zones profited from the wetter weather and high crop prices; the trucking industry benefited from the inability of the barge industry to function; and "food-producing firms in nonflooded areas of the Midwest reaped benefits because their competitors in flooded Iowa could not function for months" (Changnon 1996b, 316). Thus, communitarians may emphasize the civic obligation of these winners to compensate the losers of the flood.

On the other hand, notions of social solidarity may be used to justify government nonintervention in the event of a natural disaster. Some communitarians may argue that the mandatory extraction of compensation payments to flood victims, through taxation, undermines voluntary giving and public spiritedness. In the previous chapter, we noted that the use of positive incentives, such as subsidies, may dampen intrinsic motivation by linking desirable behavior to the receipt of some type of extrinsic reward. Individuals may then become less inclined to engage in good behavior only because it is beneficial to the community.

One can also argue that compulsory payments to victims of natural shocks may serve to dampen voluntary aid. In both the Midwest and Red River floods, volunteer efforts were commendable. Studies revealed that, in the US Midwest, the voluntary provision of flood assistance and working together to fight the flood and restore homes and towns created a sense of community across the region (see Changnon 1996b, 316). In Canada, Lewis reports:

> Amid the adversity, [an]...uplifting note was the genuine outpouring of concern by Canadians. Across the country, flood relief efforts sprang up spontaneously. One of the most moving was in Quebec's Saguenay region, devastated by the previous summer's floods. In Chicoutimi, CJAB FM morning man Martin Grenier... opened his appeal with simple eloquence: "We've got to help them, because they helped us." (1997, 2.)

Some communitarians may fear that government's impersonal mandating of contributions, through taxes, to help victims of natural disasters may jeopardize such civic spirit and intrinsic sense of community. As noted earlier with respect to libertarianism, however, private charitable giving is usually insufficient to provide sufficient compensation on its own.

Ex Ante Policy Instruments

Jurisdictions on both sides of the border had various policies that sought to mitigate the impact of flooding.

Structural Mitigation

In both the Midwest and Red River floods, structural flood control projects played an important role in the management of the floodplains. Levees and dams have long been the pillars of federal flood control policy in the United States (Mairson 1994, 74). Myers reports that the US federal government has spent over US$11 billion to protect the country's floodplains through "not only levees but dams and reservoir projects as well" (1996, 89). At the time of the Midwest flood, the river banks had a total of 1,576 levees: 229 federal, 268 nonfederal, and 1,079 private.

In March 1997, citizens of Grand Forks, N.D., began "raising dikes and laying miles of sandbag walls to protect low lying areas and critical properties" (Pedeliski 1998, 18). As Bumsted notes, Grand Forks did not have much permanent flood protection in place at the time, relying instead largely on hastily constructed temporary dikes to keep the flood waters out, a situation in stark contrast to that in Manitoba, which had a good deal of permanent flood protection (1997, 106). The provincial flood control system consists of the Red River Floodway, including the West Dike, the Portage Diversion, and the Shellmouth Reservoir and the Assiniboine River dikes between Portage la Prairie and Winnipeg. The city of Winnipeg's Primary Diking System also forms an integral part of the total protection system. Eight Red River valley towns are also protected from flooding by permanent ring dikes (Manitoba Water Commission 1998, vi). In addition, the West Dike was lengthened by a 34-kilometer extension known as the Brunkild Dike or Z-Dike, which was "completed in seven days to prevent expected floodwaters from circumventing the dike to the west," and partly heightened through sandbagging to prevent overtopping (Manitoba Water Commission 1998, v). These dikes were financed through a combination of federal and provincial funds. The Red River Floodway, the largest expenditure, was built after the Diefenbaker federal government agreed to pay 55 percent of the cost (Greenspon 1997, A1).[4]

From an economic perspective, the structural works appear to have been justified. In Manitoba, "[t]he dikes held in all eight towns protected by ring dikes as well as the hastily assembled Brunkild Dike" (Bumsted 1997, 117). Moreover, the Manitoba Water Commission reports that, in the absence of the floodway, which cost a total of $63 million to build, losses within the city of Winnipeg could have reached C$5 billion to C$7 billion. "Such a devastating loss would have jeopardized the Provincial economy.... Because of the Floodway, flood damage claims within the city of Winnipeg to date have totalled approximately $37 million" (Manitoba Water

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[4] A January 1999 announcement of $100 million in federal-provincial support for flood proofing has led to the construction of more dikes in Manitoba's flood-affected regions.

Commission 1998, v, 8). In the US Midwest, the flood protection system is also reported to have been an economic success: the US Army Corps of Engineers estimates that the levees and dams, which cost approximately US$11 billion to build, "prevented more than [US]$19 billion in potential damages" in large cities such as Kansas City and St. Louis (Wilkins 1996, 222). Thus, the benefits of protection from structural floodwork programs, in both Manitoba and the US Midwest, exceeded the costs of preparations.

Despite these economic successes, the fact that these programs are funded through federal and provincial or state revenues may draw criticism from libertarians since all taxpayers are forced to contribute indirectly to the financial costs. As noted, libertarians argue that affected individuals should take responsibility for situating themselves in risky areas, and the adverse effects of their risk taking should not have to be subsidized by other individuals in the form of taxes.

In the US Midwest, the few cities that were flooded "were those protected only by privately built levees that were not well constructed" (Church 1993, 25). The suburbs and agricultural lands did not fare well either; several suburbs suffered severe damage (Wilkins 1996, 222), and "hundreds and thousands of acres of farmland and countless homes and businesses in 9 Midwestern states were swamped" (Stinson 1996, 117–120). Church notes, "[t]he waters that flooded agricultural land mostly broke through or swept over levees not as tall as those guarding the cities" (1993, 25).

This contrast raises questions, similar to those in Manitoba, as to whether the protection of important cities came at the expense of smaller cities, suburbs, and rural areas. As discussed earlier, Manitobans generally argued that Winnipeg was given precedence over small towns with regard to flood protection. If the damage caused by floods is not shared evenly, a communitarian rationale exists for further government intervention, in the form of relief payments to areas not protected by floodworks and, moreover, as in the case of Grande Pointe, Manitoba, to towns that are affected solely as a result of flood control projects in other areas. In addition, as noted above, if sandbagging efforts were indeed concentrated in the wealthier parts of greater Winnipeg, the flood control works alone would not satisfy notions of distributive justice, as less affluent areas would remain vulnerable to damage. In sum, advocates of both communitarian and distributive justice would take the view that government should extend flood control projects to unprotected areas or combine structural flood control programs with monetary compensation to individuals and communities that do not receive the full benefits of such programs.

Despite the often-heralded reduction of potential aggregate damage, the US Midwest saw a large number of levees damaged — 39 federal, 164 nonfederal, and 879 private — and these losses themselves "represent substantial costs" (Changnon 1996c, 292). Church describes the debate about federal flood control projects that took place after the Midwest flood:

> Should the levees that gave way be rebuilt and made higher? Or should they be left alone, on the assumption that they give people living behind them a false sense of security, and should emphasis be shifted to water-proofing buildings and moving them to higher ground? In theory it might be advisable to discourage people from building or farming on floodplains — but how, given that they are very fertile and scenic? (1993, 27.)

Levees may indeed give people "a false sense of security" (Tobin 1996, 121) and inhibit individuals from engaging in precautionary behavior. As Mairson reports, a Midwest farmer's response to the need for crop insurance was, "Crop insurance? The levee is my crop insurance" (1994, 60). In sum, structural works may have the effect of encouraging habitation and development of the floodplains and require constant maintenance and amelioration of structural flood control systems, such as levees and dams. The need for such ongoing costs resulted in a re-evaluation of federal flood policy within the United States, and government agencies placed more emphasis on the possibility of buyouts and relocation, discussed below.

Buyouts/ Relocation

Before the 1993 US Midwest flood, no North American jurisdiction had employed buyout and relocation strategies to reduce economic shocks, but they emerged at the forefront of US federal flood reforms as an instrument warranting equal attention to that of control works. Under the *Hazard Mitigation and Relocation Assistance Act of 1993*, Congress legislated that funds be made available for projects to acquire and demolish homes that should not be rebuilt, to elevate at-risk buildings or relocate them to higher ground, and to floodproof at-risk structures (see Quinn 1996, 126). Soon after, Larson notes, "the most significant step that the government has taken to mitigate the future impact of floods has involved the acquisition and relocation of floodplain structures" in order to protect them from the possibility of repeated damage (1996, 102). Several communities, such as Prairie du Chien and Soldiers Grove, Wisconsin; Arnold, Missouri; Rapid City, South Dakota; and Valmeyer, Illinois, accepted the federal government's proposal and removed homes and businesses from floodplains (Tobin 1996, 119; Galloway 1996, 100). In general, within three years of the 1993 flood, the federal government, with the aid of state and local governments, had removed or relocated more than 8,000 families from flood-hazard areas in the Mississippi and Missouri river basins and, in the process, converted more than 100,000 acres of partially flooded farmland into wetlands (see Faber 1996, 105). As Stinson notes, "[w]etlands restoration, with its promise of serving as a sponge for rising waters, offers an attractive alternative for meeting future flooding-control needs" (1996, 117–120).

Many commentators argue that such a buyout program is economically efficient and serves to increase aggregate welfare in the long run because, when it was enacted, "it was estimated that it would save some $200 million over 20 years, even without another near-record flood" (ibid.). Although the initial cost of relocating communities would be substantial, a report conducted by the US Interagency Floodplain Management Review Committee asserted that "the price would be a one-time-only payment. People and their communities, once moved, would never be returned to the floodplain. And the taxpayers would never again have to pay to literally bail them out of a problem that had been anticipated" (paraphrased in Wilkins 1996, 242). Government could simply make it illegal for individuals and communities to return, credibly committing itself not to compensate future flood victims and thereby alleviating the moral hazard that explains many people's decision to stay on the floodplains. Indeed, the difficulty of making a credible commitment not to help flooded communities may be the reason subsidized relocation is economically desirable; it helps government to commit itself not to help those who do not relocate.

As well as providing economic benefits, the buyout program has been advantageous with respect to notions of distributive justice because "reconstruction continued to be beyond the reach of many people, especially those on fixed or limited incomes," and the program provided an alternative that would relieve those individuals from such a burden (Anderson 1986, 129).

Buyouts and relocation programs have not been prominent in Manitoba, but after the 1997 Red River flood, the Manitoba Water Commission recommended that "the possibility of buy-out option and relocation option should be addressed" (1998, xvi). However, relocating entire large cities such as Winnipeg would be impractical and undesirable. As Major General Stanley Genega, director of civil works for the US Army Corps of Engineers, commented, "[t]here's no intent on the part of the Corps of Engineers to line the Mississippi with concrete. But do we want to relocate St. Louis and New Orleans?" (quoted in Mairson 1994, 73). When buyouts and relocation are not feasible options, structural flood work programs are still essential in preventing vast damage.

Moreover, the US buyout program has been controversial because of its indirect cost. Economists at the University of Missouri estimate their state would lose US$200 million a year in economic activity and 3,200 jobs if farmers ceased planting in the flood plain. As a result, Washington and the landowners aim for a compromise that would move many homeowners out of the floodplain while leaving farmers and businesses there if they insure themselves against the flood risk (see Hage and Miller 1994, 54). The insurance requirement would help to solve the problem of farmers' not internalizing the risks associated with agriculture on floodplains.

Zoning Regulations and Building Standards

Some jurisdictions use zoning regulations to prevent habitation or development of floodplains. State and provincial governments have difficulty enforcing such regulations, however, because of the need to garner local cooperation. As Rossi et al. note, "one cannot take a land-use management approach to flood...hazard unless local communities can be persuaded to pass and then enforce relevant legislation," and in the past, local governments have been unwilling to enforce such regulations because of the desire to have uninhibited development (1982, 8).

In Canada, the Manitoba Water Commission reports that municipalities were not enforcing their zoning bylaws concerning floods (1998, 95), and one expert in the province notes that "[o]ur legislation never had any power to punish" (quoted in Bumsted, 132). Consequently, zoning bylaws and flood-proofing criteria for properties built in the municipalities on the Red River floodplain, including Winnipeg, have not always been adhered to (Manitoba Water Commission 1998, ix). The commission recommends placing greater emphasis on preventing development in flood-prone lands, through the effective use of zoning legislation, and on flood proofing buildings through building standards. A possible method of encouragement is the provision of federal and provincial government research grants to develop flood-proofing techniques, ideas, and innovative building designs (ibid., xvi).

The US federal government's flood reform policies, after the Midwest flood, also included a focus on mitigation measures, such as building codes to improve the chances of structures' withstanding floodwaters, wind, and earthquakes. Just before the Midwest flood, some states had enacted floodplain management ordinances requiring that structures be built to withstand floodwaters. "As a result, new buildings in states like Wisconsin and Minnesota, which had enacted floodplain-management standards exceeding national standards, often were spared serious damage" (Larson 1996, 102).

In addition to promoting building standards, the US federal government has attempted to address the problem of local noncompliance with zoning legislation by linking the provision of federal insurance to communities to the development and enforcement of zoning legislation that curbs floodplain development (see Tobin 1996, 118). As Wilkins notes:

> Where repair or rebuilding was permitted, local codes of communities participating in the [US] National Flood Insurance Program required structures damaged beyond 50 percent of their value to be rebuilt in compliance with certain minimum standards. These standards require that the lowest floor must be at or above the level of a flood that has a one percent chance of occurrence in any given year. This requirement is intended to reduce future exposure to flood risk through elevation of the structure in place of relocation outside the regulatory floodplain. (1996, 255.)

Although such regulations and policies may be efficient in terms of saving future flood damage costs, they have various disadvantages. For example, they may impose an "overwhelming economic burden on those who have to replace or repair their property and also elevate or relocate their homes or businesses" (ibid., 256). The burden is most severe on low- or fixed-income individuals and families, a problem that may engage the concern of advocates of distributive justice. In such circumstances, it may be ideal for government to provide individuals with subsidies to help them cope with the costs imposed by such regulations.

Libertarians may also oppose zoning regulations and building standards. As Tobin notes, there are "legal and ethical issues surrounding local, state, and federal policies that dictate what a private land owner can and cannot do with his or her property" (1996, 119). Consequently, as we noted in Chapter 4, libertarians may prefer flood control works, such as dams and levees, because "they are technical fixes that work by themselves, with or without modifying the land-use choices of individuals or communities" (Rossi et al. 1982, 7).

Forecasting

An extremely important tool for government in mitigating disaster is forecasting, whereby individuals and communities are informed about the timing and the extent of an ensuing flood, which aids them in determining the necessary preparations and the speed with which they must prepare. "In a flood-prone area, accurate predictions of water levels can be a matter of life and death" (Hurt 1998, 159). In the United States, the Federal Emergency Management Agency (FEMA) prepares most floodplain maps, using engineering techniques that predict the volume of rainfall runoff and the height to which floodwaters will rise (see Quinn 1996, 123). After the 1993 Midwest flood, the NWS received a poor evaluation of its ability to provide adequate and advanced warning, the key problem having been "the failure of the existing NWS hydrologic models to accurately predict flood conditions" (Changnon 1996b, 314). As discussed above, "[c]ontinuing poor estimates of flood crests, flood longevity, and when the rivers would open to navigation collectively had major effects on the barge industry and on shippers who rely on barges," for had the NWS been able to provide two or three weeks' advance notice of the development of the flood, barge shipments and equipment could have been moved from danger and severe costs prevented (Changnon 1996c, 304; 1996a, 203). In 1997, the NWS was also criticized for underestimating the extent of the flood, resulting in insufficient preparations by the property owners and city of Grand Forks (Hurt 1998, 160). Changnon notes that such failures indicate "long needed improvements in models and computer capabilities at NWS river forecast centers" (Changnon 1996b, 314).

Manitobans received more warning, had more time to prepare, and were able to observe vividly, on the evening news, the ferocity of the Red River flood as it hit their southern neighbors in North Dakota.

> Manitoba Water Resources Branch uses a flood forecasting procedure that relies heavily on observations from past floods, making it difficult to predict a flood with a magnitude beyond the range of experience....That being considered, the results for 1997 were generally good considering the unprecedented magnitude of this event and identified technical limitations. (Manitoba Water Commission 1998, vii.)

Bumsted notes that Canadian forecasts were assisted by the revised US forecasts (1997, 108). In addition, Hurt attributes the positive evaluation of Canadian forecasts to Alf Warkentin, labeled as "one of the best forecasters in the business." After watching the devastation that hit Grand Forks, "Warkentin knew...he had to do much better than the American forecasters" (1998, 159, 160). Dikes were raised to correspond with Warkentin's consistently good estimates, which saved lives and property.

The two exceptions, as noted earlier, were the towns of Grande Pointe and Ste-Agathe. "Poor forecasting results for [Grande Pointe] ...left the people ill-prepared for the flood," and Ste-Agathe was flooded suddenly and unexpectedly as "current forecasting procedures are not capable of predicting complex flow patterns outside of the main banks of the river" (Manitoba Water Commission 1998, vii). The result was devastation and severe loss for the two communities. The commission, in its report, noted the need for the effects of the floodway to be taken into consideration when estimating water surface elevation in affected towns, such as Grande Pointe, and the need for "[e]ffective means of communicating flood forecasts to all individuals in the Valley [to] be in place well in advance of the arrival of the flood peak" (ibid., xi, xiii). In Winnipeg itself, residents of areas at risk of flooding received packages that included information on forecast water levels, heights of dikes, and the number of sandbags required. Following the distribution of the information, the city hosted three public meetings and held demonstrations of sandbag dike building (see ibid., 82).

Such communicative policies are beneficial because individuals are unlikely to have the information or financial means to predict the timing and extent of floods and other natural disasters or the knowledge of how to prepare. Moreover, such information is a public good, suggesting a role for government. A disadvantage of such communicative policies, however, is the lack of any guarantee that individuals will adjust their behavior in a desirable manner in response to the information provided, particularly if they anticipate compensation for losses suffered. For example, individual farms in the Red River towns of Morris and St-Jean-Baptiste, Manitoba, were severely inundated by the flood and, despite warnings, "it is not clear that anyone even tried to build a dike" (Gray 1997, A1). Thus, it may be advisable for government to accompany forecasting with other policy instruments — for example, command-and-control regulations, such as zoning and building standards.

Finally, Wilkins suggests that, instead of providing information itself, government can mandate the provision of information through the private sector. "For example, many experts believe the real estate professional should investigate and disclose flood risks when properties are initially offered for sale and...lending institutions should also provide such disclosures at the time of loan application" (Wilkins 1996, 269).

Mandatory Evacuation

On April 23, 1997, the Manitoba Emergency Management Organization issued a mandatory evacuation order for much of the Red River valley (Hurt 1998, 158–159). In total, 28,000 Manitobans were evacuated, more than 10,000 of them from the greater Winnipeg area, because of the possibility of a dike failure (Manitoba Water Commission 1998, v; MacDonald 1997a, 30–34). Police officers arrived at people's doorsteps and forced unwilling property owners and farmers to abandon their property (Hurt 1998, 158–159).

Such mandated orders are likely to face strong criticism from libertarians for constraining individual liberty. In addition, many Manitoba residents who returned to their destroyed homes after the flood complained that they could have saved them. "If I'd stayed, I could have easily pumped the water out," one resident told a journalist (ibid., 168). Bumsted reports that some residents felt that, because they were forced from their homes when they had wanted to stay and protect them, they were entitled to full reimbursement (1997, 124). Nonetheless, the provincial government has been reluctant to compensate fully for flood losses because of the fear that doing so would encourage habitation of the floodplain.

Ex Post Instruments

In efforts to ameliorate the devastating effects of these floods, various policies emerged.

Disaster Relief

After the 1993 Midwest flood, the US Congress authorized more than US$6.4 billion in emergency aid (Cohen 1994, 54). In Manitoba, after the Red River flood, the provincial government announced that compensation would be capped at C$100,000 per property (90 percent paid by Ottawa) with a C$20,000 deductible, to be waived for property owners whose houses had to be demolished and who had followed flood-proofing programs (Thomson, MacDonald, and Sandrel 1997, 29; Turbide 1997, 47).

The perceived inefficiency of extensive disaster relief payments evoked much criticism in the United States after the Midwest flood. Disaster relief aid is

> an area of largely uncontrolled government spending. Because money is allocated both on an ad hoc basis by Congress and spent from the budgets of federal agencies, Washington does not know how much it spends annually to relieve the suffering of taxpayers victimized by floods, fire or hurricanes. (Cohen 1994, 54.)

Moreover, other policy instruments may be less costly than disaster relief payments; US authorities argued that, although it would have cost approximately US$500 million to relocate river towns, US$2.35 billion would be delivered as compensation after the Midwest flood in the form of one-time crop-loss payments (Wilkins 1996, 264). And, as Wilkins notes,

> [g]enerous disaster assistance creates negative incentives for the purchase of flood or crop insurance. Provision of such assistance to those individuals without insurance creates a perception among many floodplain residents that purchase of hazard insurance is not a worthwhile investment. (Ibid., 271.)

Larson claims that relief programs also provide disincentives "for states and communities to develop effective flood-prevention strategies" (1996, 103) because they may fail to internalize the costs of natural disasters, given the knowledge that relief aid is available.

These criticisms contributed to the reformation of the US federal flood program with a new emphasis, as noted above, on mitigation strategies such as buyouts and changes in insurance policies. However, politicians often have to strike a balance between satisfying taxpayers and the victims of natural disasters. After the Midwest flood, President Bill Clinton was quick to promise aid because he was "determined not to get in the same bind as George Bush, who reacted slowly to hurricanes in Florida, Hawaii and South Carolina and was blamed not only for failing to relieve suffering but also for slowing economic recovery in those areas." But in an attempt to limit the amount of federal aid and, consequently, the burden on taxpayers, "the President and his aides insisted that Washington could not make up flood losses dollar for dollar: states, local governments, private charities and the victims themselves will have to bear much of the cost" (Church 1993, 27).

Complaints in Manitoba concerning disaster aid came largely from victims and, in contrast to criticisms of the Midwest flood relief efforts, centered on the inadequacy of relief payments. Residents of Grande Pointe, who believed their town had been sacrificed to save Winnipeg, were disappointed with the large deductible of C$20,000 that had to be paid before any money would be compensated; with the C$100,000 cap, which was not likely to put many Grande Pointe homeowners back in their houses; and with the policy of assessing damaged goods at their depreciated value, rather than at their replacement cost (Bumsted 1997, 120–124; see also Thomson, MacDonald, and Sandrel 1997, 29). Other rural dwellers, such as Jim Shapiro of St-Germaine, who had spent a total of C$18,000 on sandbagging dikes, packing, and moving, were offended that Manitoba's compensation package was based on depreciated value: "I've got to pay brand-new prices for whatever I need. This is grossly unfair. I anticipated the flood; I acted efficiently and appropriately. Now I'm being penalized for being prepared" (quoted in ibid., 104).

Although federal and provincial governments are becoming weary of granting extensive payments because of the belief that they encourage habitation and development of floodplains and discourage flood preparations, it may be appropriate to ensure, perhaps through differentials in compensation, that their relief programs do not have the effect of imposing a disproportionate burden on those who attempt to mitigate flood damage. In discussing the Midwest flood, Larson criticizes US federal government relief programs for producing disincentives for flood mitigation in that communities that sustain the most damage often receive the most assistance. These are the ones that government is prone to declare disaster areas. Consequently, communities that aggressively pursue flood-prevention strategies, yet still end up with losses, "wind up paying twice for their efforts" (1996, 103). Moreover, in the case of Manitoba, where flood control works paid for by all provincial taxpayers were concentrated on protecting Winnipeg, the residents of the towns and suburbs that remained unprotected — and particularly the residents of Grande Pointe, which was flooded solely as a byproduct of the floodworks — should, from a communitarian perspective, be compensated.

In sum, government needs to address two concerns in providing relief. One is generous relief payments, which have the effect of encouraging development of the floodplains and underpreparation. The second is offering less compensation to those who attempted to mitigate damage than to those who made no such efforts, a discrepancy that may limit citizens' attempts to anticipate flood damage and take steps on their own to mitigate it. If the costs of such actions are not accounted for when government aid is distributed, taking precautions may be more costly to an individual than not doing so. In dealing with these dual concerns, instruments apart from outright relief payments can be used; examples include insurance and loans.

Insurance Programs

As noted before, private flood insurance markets are nonexistent in Manitoba and minimal in the United States. In 1968, the US Congress

> created the NFIP [National Flood Insurance Program] in response to mounting flood losses and escalating costs to the general taxpayer for disaster relief. The NFIP provided relief from the impacts of flood damages in the form of federally subsidized flood insurance to participating communities, contingent on flood loss reeducation measures embodied in local floodplain management regulations. (Wilkins 1996, 250.)

The primary purpose of such a program is to internalize the costs of living on floodplains, to "return to the landowner the cost of his/her locational decision, and thereby shift the burden from the taxpayer....[However,] the program has fallen short of achieving its objective of shifting the burden of flood losses from the taxpayers" (ibid.). Despite the availability of subsidized insurance, only one in four people living on floodplains buys it (Cohen 1994, 55). Myers attributes this outcome largely to the existence of extensive relief payments: "FEMA...doles out disaster relief that is generous enough to dissuade many people from purchasing insurance protection, which it also offers" (1996, 95). In total, insurance claims for the Midwest flood amounted to US$250 million, in stark contrast to the US$6.4 billion paid out in federal assistance (see Wilkins 1996, 257). The disincentive to purchase federal insurance is evident in the report of the Interagency Floodplain Management Review Committee (formed by the US government after the Midwest flood), which stated that

> many property owners who were harmed by the 1993 flood had been eligible for federal flood insurance but had failed to participate in the program. Nevertheless, they received federal disaster assistance in amounts that nearly equaled the benefits provided to property owners who were insured. (Galloway 1996, 100.)

A columnist for the *Wall Street Journal* noted, "[t]hose who don't buy [insurance] aren't stupid. They know that the government will step in with disaster relief" (quoted in Mairson 1994, 74). The columnist advised that the government stop subsidizing the NFIP, allow insurance premiums to reflect the true risks of living on the floodplain, and, moreover, terminate extensive government assistance; then those who cannot afford the insurance and who know the government will not bail them out will not live on floodplains (ibid., 74). However, those affected by natural shocks "won't want less federal assistance," and may lobby government for continued aid (Wilkins 1996, 274).

Although only a small percentage of property owners on the floodplains had insurance before the 1993 flood warnings,

> property owners suddenly began to sign on...[after hearing] about the rising flood waters on the nightly news....[Consequently,] insurance officials, as well as government regulators, feared that companies backed by the federal government would have to pay new policy holders, who had contributed little to the insurance fund, large sums to cover costs of flood-related damages. (Larson 1996, 103.)

Fortunately, this example of the adverse selection problem did not leave the program insolvent, as claims did not exceed $270 million (ibid.).

A final concern regarding the flood insurance program is that of moral hazard. Some critics contend that the program has encouraged development on floodplains by giving homeowners an unreasonable sense of security. They claim that property owners may develop areas that face a significant flood risk if they know that buildings can be insured against damage. As Quinn notes, however, "[i]f this contention was true,...homeowners would surely buy and keep national flood insurance policies. But statistics show that most do not" (1996, 124). The problem with insurance programs thus seems to lie instead in the disincentives to purchase insurance, largely the presence of disaster relief.

The recognition, after the US Midwest flood, of the need to increase the number of federal insurance policyholders led to federal insurance reforms. In September 1994, Congress passed the *National Flood Insurance Reform Act*, expected to "dramatically increase participation in the national flood-insurance program" (Larson 1996, 103). While the program has always required prospective homeowners to purchase flood insurance as a prerequisite for obtaining a mortgage, the act introduced command-and-control penalties for lenders who do not ensure that mortgage holders follow that rule; it also closed a loophole that allowed borrowers to drop the insurance on getting a mortgage.[5] In addition, in order to alleviate the problem of a last-minute rush on the insurance program during a flood emergency, the act "requires policy holders to wait thirty, not five, days before coverage becomes valid" (Larson 1996, 103).

Using a tool similar to the requirement that mortgage holders obtain flood insurance, Congress has attempted to increase crop insurance coverage by legislating that "[a]s a condition for receiving support payments for 1995 and subsequent crops, or for obtaining a direct loan or loan guarantee, a producer must obtain catastrophic risk protection insurance coverage," under the federal flood insurance program (Wilkins 1996, 265).

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[5] See Larson 1996, 103; "Out of the Mud, Some Lessons," *The Economist*, May 27, 1995, p. 28.

A final reform to the NFIP, after the Midwest flood, was the introduction of mitigation insurance:

> Congress, realizing that grants alone are insufficient to meet the need for flood-mitigation projects, has also provided for mitigation insurance in the National Flood Insurance Program. Standard flood insurance pays to repair a flood-damaged home to its pre-damage condition, leaving it vulnerable to the next flood. Mitigation insurance, by contrast, pays the owner of an insured, flood damaged structure an additional settlement to help pay for mitigation measures to prevent or reduce future flood damage. (Quinn 1996, 126.)

Mitigation measures include relocating the structure or, in the alternative, elevating the foundations or flood proofing (ibid., 126).

The insurance reforms, if effectively enforced, will contribute to a decline in dependence on disaster relief as individuals face more stringent insurance obligations when they obtain mortgages, grants, or loans. Mitigation insurance itself — to the extent that insurance payments are made available only for relocation, building elevation, and flood proofing — produces a supplementary benefit that works similarly to buyouts and building standards in its prevention of devastating future damage. Consequently, it may be beneficial for officials in Manitoba to explore adopting similar insurance programs to those of the United States.

Subsidized Loans and Loan Guarantees

In the wake of the 1993 Midwest flood, the US Small Business Administration (SBA), which provides loans to businesses that suffer property and other economic losses stemming from a natural disaster, approved more than 20,000 loans (Tobin 1996, 114–121). As discussed in the previous chapter, it is likely that taxpayers prefer loan programs to disaster relief because the former are "not outright handouts despite the substantial subsidies often involved" (Lund 1989, 130). Moreover, since loans must be paid back, such programs may avoid the disincentives that many people perceive to be present with disaster relief payments: individuals are unwilling to build outside floodplains or are unwilling to take certain precautions to mitigate damages because of the knowledge that they will be bailed out by taxpayers. Another advantage of loan programs is that, in theory, one of their goals is "to assist victimized businesses that commercial lenders might consider too 'risky'" (Tierney, Nigg, and Dahlhamer 1996, 218). Thus, loan instruments have the potential to benefit the disadvantaged and garner support from advocates of distributive justice. In practice, however,

> businesses that had the most success in obtaining SBA disaster loans were those that would have qualified for commercial loans relatively easily. Conversely, the businesses that had least success in acquiring SBA loans were firms which would have found it difficult to qualify for and obtain private commercial loans. (Ibid.)

As Lund notes, "evidence suggests that beneficiaries of guarantee programs generally come from middle and lower middle economic strata," and the least advantaged "are not much helped" (1989, 155).

In sum, if government loan instruments are implemented in a manner that fulfills the goal of assisting risky entities, they may be preferable to disaster relief payments because they may entail less cost to taxpayers and are more likely to induce individuals and businesses in flood-prone areas to internalize the costs of their actions and to engage in preparations to mitigate flood damage. However, because these entities are "risky," the chances of loan defaults may be high, raising the cost of the loan program.

Private Charity

As already noted, private charity has been an important element of recent flood relief, the Red Cross having received more than US$10 million during and after the Midwest flood (Sieder 1993, 37), and more than C$13 million was raised in Canada through events and organizations, such as the Red Cross and Salvation

Army, for victims of the Red River flood (Thomson, MacDonald, and Sandrel 1997, 117). The climax of fundraising events in Canada was the May 18, 1997, Red River Relief Concert organized by Manitoban actor and singer Tom Jackson, which raised about C$1.3 million (ibid.). As discussed in Chapter 3, government can use tax credits to provide incentives for charitable donations, as is currently done in both Canada and the United States (see Bemelmans-Videc 1998, 45). Libertarians would approve of private charity because it involves government minimally, and communitarians because it demonstrates civic spirit and binds communities. Nevertheless, as noted earlier, "[l]ike all flood funds since 1950, the money raised in 1997 was to be used chiefly to supplement government assistance," rather than supplant it (Bumsted 1997, 130).

Conclusion

The 1993 Midwest and 1997 Red River floods were devastating natural shocks that, in their aftermath, produced an opportunity for flood policy evaluation. The debate that emerged after the Midwest flood concerned the promotion of relocation as a primary policy instrument, replacing the emphasis traditionally placed on structural floodwork protection. A cost-benefit analysis is unlikely to support the relocation of a large city, such as St. Louis or Winnipeg, but may support relocation strategies for smaller communities; the costs entailed in relocating them may be exceeded by the savings achieved in eliminating the demand for the constant building and rebuilding of structural works and payment of disaster assistance. Government could provide monetary incentives in the form of buyouts to small communities to relocate, or mandate the movement of individuals through command-and-control mechanisms. Libertarians would strongly oppose the latter constraint on choice. In addition, if floodplains are largely inhabited by low-income families, compensation has a distributive justice rationale as the costs of relocation are likely to be burdensome. For structural strategies, governments often engage in cost-benefit analyses to determine whether floodworks should be built or extended in certain communities. For example, in Manitoba, the towns of Ste-Agathe and Grande Pointe were left unprotected by the floodway because the provincial government determined that extending its protection to these small communities would be inefficient. Nonetheless, communitarians may argue for protection in order to avoid community disruption, regardless of inefficiencies. Alternatively, individuals in unprotected communities should receive *ex post* compensation for losses, as many residents of Grande Pointe and elsewhere argued.

Efficiency proponents argue against *ex post* disaster payments, believing that they produce disincentives to mitigate the effects of natural shocks. After the 1993 Midwest flood, the US federal government attempted to alleviate dependency on disaster aid by making changes to the National Flood Insurance Program that would promote the purchase of flood insurance. Economists prefer government-provided flood insurance because, unlike disaster relief, which is costless to recipients, insurance premiums induce individuals to internalize the cost of living on floodplains. However, low-income families are more likely to settle on floodplains, at least in the US Midwest, because of low property prices. In such an event, considerations of distributive justice may still support disaster assistance tied to relocation or flood-proofing requirements: low-income households are those least likely to be able to afford flood insurance yet most likely to be affected by the devastating effects of floods.

This case study on the economic shocks caused by flooding provides an important lesson for policymakers. Efforts to deal with regularly occurring shocks on an *ad hoc, ex post* basis tend to result in similar costs in the future. When flood relief is provided on a wide scale, it creates expectations of similar actions in the future. Thus, even though federal flood insurance is subsidized in the United States, only about a quarter of people living on floodplains actually buy it, and insurance payments are dwarfed by flood relief payments. The lesson is that the cost of intervention will be very high if the policy instrument chosen to deal with the problem does not attempt to limit future costs. Relocation assistance, for example, may be less costly in the long run than subsidized loans for rebuilding.

Different normative rationales have different bases for intervention. Communitarians may oppose relocation programs. It is worth noting, however, that regardless of the normative approach, the costs of programs that do not go to the root of the problem can be very high. Even if a communitarian or a distributive justice rationale calls for intervention in the face of flooding, governments should pay attention to *ex ante* intervention that seeks to mitigate the effects of floods, such as building floodways, rather than *ad hoc*, *ex post* instruments such as relief payments that increase the cost of future shocks.

6

Market Shock Case Study 1: *The Oil Shocks of 1973 and 1979*

The two oil shocks of 1973 and 1979 were entangled in politics. For the purpose of this case study, however, we explore only their economic dimensions: the economic effects of a drastic increase in the price of a valuable input and the resulting mitigation strategies.

In October 1973, Arab oil-producing members of the Organization of Petroleum Exporting Countries (OPEC) announced they would cut crude oil production and increase prices in response to US support of Israel during the Arab–Israeli War (see Rybcznski 1976, 2). In 1972, the world price for a barrel of oil had been US$2; by 1974, it had increased to US$11 per barrel (Badger 1984, 33). Penrose notes that, apart from the political aspects, the shock can be partially attributed to a tight market for oil, stemming largely from "the rapidly growing United States demand for Middle Eastern oil, which reached a peak in 1973," creating a seller's market (1976, 47, 53).

In December 1979, a second price shock occurred with the cutoff of Iranian oil supplies following the collapse of the shah's regime in late 1978. The official price of Middle Eastern crude oil rose from US$12.70 in December 1978 to US$24, an increase of almost 100 percent (see Kohl 1982, 1).

The effects of both shocks were vast and numerous, impacting virtually all segments of the population in oil-importing countries, including Canada and the United States. Consumers faced higher heating, electricity, and gasoline costs, and industries, such as steel and aluminum, that used large quantities of oil in the course of production were forced to raise their own prices, which lowered demand for their goods and reduced their demand for labor.[1] As Werner notes, "the effect of higher oil prices rippled through food chain distribution networks, plastics and other petrochemical products, creating reduced demand and unemployment" (1978, 2). In addition, the curtailment of automobile and bus travel, due to the high costs of gasoline, adversely affected tourism and related industries (see Horwich and Weimer 1984, 98).

In sum, a report on the United States conducted by economic consulting firm Data Resources, Inc. (DRI) found that "the sharp OPEC price hikes of late 1973 and early 1974 knocked $20 billion off real growth in 1974's gross national product...[and] by year-end, they increased unemployment from 5.6% to 6.6%." By mid-1974, the unemployment rate was 8.9 percent, and DRI reported that but for the oil shock, unemployment would have been 6.9 percent.[2]

Rationales for Government Intervention

The oil shocks evoked demands for government action in the developed, oil-importing countries. We consider how such action aligns with the normative rationales for government intervention that we described in Chapter 3.

Economic Efficiency

Economists are likely to argue against government intervention in the face of such market shocks because they believe that the free market maximizes efficiency by allocating energy to its most highly valued uses through "a bidding process in which those who have the greatest economic stake in the oil offer the highest prices" (Horwich and Weimer 1984, 32). Moreover, as an article in *Business Week* reported, many businesses had anticipated the shock and spent months developing mitigation strategies, such as the development of energy-saving technologies. General Electric's private energy conservation programs, for example, which included the fixing of steam leaks, produced savings of up to 13 percent.[3]

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[1] Rybczmski 1976; see also "The Pinch at the Pump Begins," *Time*, November 12, 1973, p. 108.

[2] The DRI findings were summarized in "How OPEC Has Worsened US Economic Woes," *Business Week*, October 13, 1975, pp. 34–35.

Scholars, such as Levmore, would not support government compensation in such cases because it creates disincentives for potential losers to anticipate change and to act in a manner that promotes the social interest (Levmore 1999, 2, 6). Moreover, high oil prices may in time fall on their own as new sources of supply arise owing to the exploration incentives that high prices provide.

Government intervention may be desirable to some extent in the face of significant profits on the part of domestic oil-producing companies that benefit from drastic increases in the world price of oil. In 1980, oil companies in the United States were said to account for 40 percent of the total profits of the manufacturing sector.[4] The result was a loss of economic efficiency as oil company management, "with more money than they know what to do with, [took] on unfamiliar projects, while other companies [had] to abandon some ventures because of lack of funds." There was also concern that oil companies, seeking to utilize their excess resources, would engage in misdirected mergers; the suggested solution was the additional taxation of such companies to reduce their "cash hoard."[5]

After the 1979 oil shock, the federal governments of both the United States and Canada did raise the level of domestic oil revenue taxation, recycling the funds into other projects. Of course, whether such intervention is economically efficient depends on whether firms, if left to their own devices, would devise efficient means to allocate profits, or whether government can improve on the allocative mechanisms within firms. As the ineffectiveness of government intervention in many of the case studies in this monograph illustrates, markets likely work better than governments in this regard.

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[3] "Business Scrambles to Save Fuel," *Business Week*, November 17, 1973, pp. 22–24.

[4] "The Implications of Oil Companies' Profits," *Business Week*, August 18, 1980, p. 84.

[5] Ibid., pp. 84, 87.

A final point concerns the role of insurance markets. As already noted, government intervention may be justified because of a lack of private markets to insure against market risks such as international price volatility (see Cassing, Hillman, and Long 1986, 241; Eaton and Grossman 1985, 259). Anthony suggests, however, that private market risk-management tools, such as forward, futures, and options contracts, can serve as insurance against price shocks, thus reducing the need for government action (1995, 211–212).

Libertarianism

As noted in previous chapters, libertarians advocate minimal government interference and consequently support private mitigation efforts in the event of a price shock. Before and after the first oil shock in October 1973, various businesses voluntarily engaged in the formulation and implementation of energy-saving strategies. For example Northrop had holes cut in its plant roofs and covered them with plastic bubbles in order to supplement artificial lighting with natural light.[6] Homeowners designed and built "their own sunheated homes without waiting for the government or industry to do it for them."[7]

Distributive Justice

Utilitarians advocate that resources be distributed in a manner that maximizes aggregate social welfare. As discussed in Chapter 3, some utilitarian scholars believe that social utility will increase from a more equitable redistribution of wealth (see Buchanan 1985, 55; Rose 1991, 223). Although this view is highly contested, it may be possible to justify government involvement in distributing wealth from domestic oil producers (that is, their shareholders), who are much better off as a result of an oil shock, to individuals and businesses that are adversely affected. Redistribution can be achieved through imposing income taxes on oil companies, then using grants, subsidies, or tax rebate to transfer that revenue to individuals and industries in distress. Such a policy was adopted by US President Jimmy Carter after the second oil shock; the federal government imposed a 50 percent tax on the revenue companies garnered from decontrolled oil, and the funds were recycled into various programs, which included assistance to the hardest-hit poor, in the form of grants, to alleviate the burden of higher energy prices.[8]

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[6] "Business Scrambles," 22.

[7] "Main Street Tackles the Energy Shortage," *US News and World Report*, April 23, 1979, p. 35.

This government role may also be supported by Rawlsian distributive justice, which advocates policies that benefit the least advantaged. "From the standpoint of consumers, higher energy prices...mean personal hardships, especially for those in the lower income brackets who spend a greater percentage of income on energy. Energy consumption or the consumption of nonenergy goods and services, or both, will have to be reduced" (Barth and Berk 1984, 130). As Horwich and Weimer note, a substantial reduction in the use of heating oil may not be an option as it may result in health risks for small children, the elderly, and the ill (1984, 141). Thus, distributive justice can serve as a rationale for government involvement in order to assist such affected groups.

Advocates of Rawlsian justice and of utilitarianism may disagree about who should bear the burden of redistributive policies. Both support transfers of wealth from oil companies (and their shareholders) to less advantaged individuals and businesses, as noted above. However, if assistance to less advantaged groups is financed by taxpayers at large, utilitarians may not support such intervention. Although those receiving assistance face an increase in welfare, it may not be greater than the disutilities faced by the larger group of taxpayers, many of whom were also adversely affected — although perhaps less severely — by the oil shock.

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[8] See Goldman et al. 1979, 22; "Carter's Energy Plan: Bumpy Road Ahead," *US News and World Report*, April 16, 1979, pp. 19–20.

As noted earlier, the distributive justice argument was particularly contentious in Canada, where the provinces have jurisdiction over natural resources, and the decision to cap domestic oil prices and transfer oil revenues from the "have" provinces to the "have-not" provinces essentially forced subsidizations and revenue transfers from Albertans to the rest of the country, facilitated through federal taxes on profits from oil revenues. Until 1977, 50 percent of resource revenues were equalized; after that year, the percentage was reduced to 25 percent (Boadway, Flatters, and LeBlanc 1983, 180).[9]

The rationale behind Canada's equalization payments is to "ensure that all Canadians enjoy reasonable comparable levels of public services at reasonably comparable levels of taxation, whether they live in St. John's, Calgary or Yellowknife" (Verburg 2000, 9). Utilitarians support such transfers on the grounds that the benefits received by residents of resource-poor provinces are greater than the disutilities suffered by residents of resource-rich provinces. However, in the past, the transfer system has created some perverse inequalities. One 1998 C.D. Howe Institute study (Boothe 1998) demonstrates that the system transfers wealth from poor Canadians in rich provinces to rich Canadians in poor provinces. Unless such distortions are resolved, advocates of both utilitarianism and Rawlsian justice may criticize the equalization system.

Corrective Justice

During the oil crises of the 1970s, problems arose in the United States with price gouging: oil companies were alleged to have colluded to evade energy-price controls and overcharged consumers, resulting in consumer injury (Evans 1988, 14). Corrective justice may provide support for a system whereby injured consumers can receive compensation, directly or indirectly, from oil companies that engaged in illegal overcharges or misrepresentation. In 1983, Exxon paid a $2.1 billion settlement for misrepresenting "old oil" in its Hawkins field in Texas as more expensive newly extracted oil. Evans notes:

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[9] In January 2001, the controversy re-emerged when Ottawa announced a $10 billion cap on equalization payments. Manitoba Premier Gary Doer's complaint that the transfer from Alberta should be bigger, given its growing oil revenues, was not well received by Alberta Energy Minister Steve West.

> The Exxon judgment took the legal principle of "indirect restitution" and established it on a grand scale. Rather than reimburse injured individuals, the judge directed funds to other entities to act on their behalf. [US District Court Judge] Flannery awarded the entire $2.1 billion to state governments for use in energy-related consumer programs. Some of the better known ones provide weatherization in low-income homes, assistance to low-income families to pay fuel bills, and energy renovations in schools and hospitals. (Ibid., 15.)

An action known as the "Stripper Well case" soon followed, whereby several firms were forced to disgorge a total of $1 billion that they had gained from charging consumers oil prices above the established limit. In this particular settlement, 80 percent of the funds was set aside for indirect restitution, as in the Exxon case, and 20 percent for direct refunds to injured parties (ibid., 14–15). However, it is questionable whether corrective justice was being fulfilled. Many victims did not necessarily benefit from the established government programs, and "most private individuals [found] the refund too small to bother about" (ibid., 15).

Communitarianism

The oil shocks of 1973 and 1979 created both winners and losers. In most countries with domestic oil producers, such as the United States and Canada, the higher prices resulted in "large-scale redistribution of wealth and income from consumers and companies to the oil industry" (Dack 1973, 1). In the United States, fuel-producing areas, notably the southern and southwestern states, were the beneficiaries of increased profits and increased exploration and development.[10] In Canada, the western petroleum industry, largely located in Alberta, recorded enormous profit gains; an August 1973 estimate was that a 40-cent-a-barrel rise in oil prices would raise oil revenue by C$700,000 to C$750,000 a day, or a total of more than $255 million a year, with a consequent increase in royalties paid to the government of $40 million to $45 million (ibid., 1). After the second oil shock in 1979, Ontario Treasurer Frank Miller argued that the benefits and burdens of the oil shock should be shared by all provinces and territories. High prices, he said, if not recycled throughout Canada, "will rip the country and the economy apart," and he called Alberta's attempts to benefit further from still higher oil and gas prices "a real and severe threat to national unity" (Osler 1979, S4). The redistributive stakes were enormous:

> A 1979 Ontario government paper established that a $7 per barrel increase in the price of oil would add $3 billion to the coffers of the producing provinces, while adding 3.2 percent to the Ontario inflation rate and reducing its GPP [gross provincial product] by 1.5 percent. The revenue bonanza, Ontario argued, was creating massive inequalities in the revenues of provincial governments. (Simeon and Robinson 1990, 236.)

In addition, Osler notes, the federal government and, hence all Canadian taxpayers had been contributing 63 cents for every dollar spent in Alberta for exploration through the use of tax incentives (Osler 1979, S4). Given that all taxpayers had shared the burden of exploration costs, communitarians are likely to argue that the Alberta government and the oil companies that benefited had a civic duty to reciprocate by sharing the benefits of the rise in oil prices. Between 1973 and 1979, Alberta did, in fact, contribute C$16 billion to the Canadian economy from taking lower-than-world prices for its hydrocarbons (ibid., S4).

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[10] "The Nights the Lights Went Out," *Time*, November 12, 1973, p. 108.

In 1980, the Trudeau government established the National Energy Program (NEP). Its centerpiece was the establishment of a single Canadian consumer price, set below the world price, and the development of a new revenue-sharing scheme comprising new taxes on oil and gas production and on exports, whereby the federal share of oil revenues rose from an estimated 12.0 percent in 1979 to 27.5 percent in 1982, dropping the provincial share from 49 to 41 percent (Simeon and Robinson 1990, 243). Ottawa justified this policy on the grounds that "the price changes resulting from OPEC benefited some parts of Canada at the expense of others"; in order to ensure fairness and national unity, the benefits and burdens had to be shared by way of federal taxation and redistribution (ibid.).

Albertans criticized the NEP intensely. Premier Peter Lougheed charged Ottawa with trying to take over the province's resources and with attempting to relegate the residents of all provinces except Ontario and Quebec to the role of second-class citizens (see ibid., 245; Doern and Toner 1985, 269).

Doern and Toner also note that the NEP was simply inefficient; they hold the view that the refusal to allow a rapid movement to world prices resulted in delayed economic adjustments. Moreover, they report that the Alberta oil and gas industry and the provincial economy were driven to considerable underutilization of capital and a severe loss of jobs because of the price controls (Doern and Toner 1984, 483). The dispute was eventually resolved in 1981 with the signing of a Canada-Alberta agreement whereby domestic oil prices for new oil were allowed to match the international price, old oil prices could be raised to 75 percent of the world price, and taxation policies under NEP were amended (see ibid., 333; Simeon and Robinson 1990, 246). Doern and Toner note that Ottawa was able to make such concessions to the oil-producing provinces without alienating the oil-importing provinces because global developments at the time had softened the upward pressure on oil prices (1984, 288).

In sum, communitarianism provides a rationale for government to create policies that would allow for a sharing of the benefits of oil production across Canada and consequently the alleviation of losses in oil-importing provinces. Obviously, however, although the disproportionate distribution of benefits and burdens may threaten the unity of a nation, so may the attempts to correct it.

Ex Ante Policy Instruments

Paul Verleger, a senior US Treasury Department official in the Carter administration, noted that the development of alternate energy sources and the filling of the Strategic Petroleum Reserve were "reasonable hedging strategies" to deal with the risk of oil price volatility.[11] In addition, conservation programs, which at times have been implemented after the initial price increase, can also be adopted as an *ex ante* measure in order to lessen dependence on imported oil in general and, consequently, to mitigate the effects of an international oil price shock. Several policy approaches are possible.

Stockpiling

Stockpiling is an insurance mechanism used to mitigate price increases during and after oil interruptions (Alm 1984, 16). Such policies have proven beneficial in Europe. Following the 1971 recommendation of the Organisation for Economic Co-operation and Development, (OECD), European countries had approximately 90 days' worth of oil reserves in storage and an additional 30 days' in shipment (Darmstradter and Landsberg 1976, 35). Consequently, after the October 1973 oil shock, Europe had no immediate crisis in actual supplies (see Prodi and Clô 1976, 98). In the United States, the federal government had begun stockpiling crude oil in the early 1970s. By the mid-1980s, the Strategic Petroleum Reserve contained over 300 million barrels of oil, which Devarajan and Hubbard note, represented "a potentially significant tool for reducing the economic damage attendant to oil supply disruptions" (1984, 187). The costs of the program were high, however, especially as quantities increased and new storage facilities had to be established. Consequently, during periods of declining oil prices, the costs to taxpayers of funding the program may have exceeded the perceived benefits. In the late 1980s, the Reagan administration, facing unprecedented budget deficits, discontinued the public reserve program.

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[11] Quoted in "Should the US Be Planning for Another Oil Shock?" *Business Week*, April 4, 1983, pp. 104–105.

Substitution

In 1979, *Time* magazine advocated the rapid development of alternate energy sources such as coal, natural gas, and nuclear fuels, in addition to energy conservation, to mitigate the impact of scarce supplies of oil and rising prices.[12] In West Germany, the impact of the first oil shock was mitigated through the use of coal and natural gas substitutes. Coal consumption increased by almost 8 percent and natural gas consumption by 21 percent, with the result that total energy consumption in West Germany declined by only 2 percent (Prodi and Clô 1976, 101). In Canada, the NEP of 1980 focused on both supply- and demand-side measures. On the supply side, the program sought to encourage the development of domestic conventional and nonconventional energy resources through a combination of tax incentives and grants (Nemetz 1981, xvii). For example, federal grants were provided for the exploration of northern Canadian lands (Simeon and Robinson 1990, 243). On the demand side, the federal government provided incentives, largely in the form of grants, for substitution away from petroleum to natural gas, electricity, coal, and renewable energy sources (Nemetz 1981, xvii). Doern and Toner note that such demand-side substitution policies contributed to a 22 percent reduction in the demand for oil between 1980 and 1983 (1985, 482).

Considering a policy of increasing the supply of substitutes, Lovins and Lovins assert that conservation strategies would be more efficient than the building of more coal or nuclear power stations. They argue:

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[12] "The Oil Squeeze of '79," *Time*, March 12, 1979, pp. 44–46, 51.

> Since less than five percent of our electricity is made from oil, and less than five percent of our oil is used to make electricity, the two have almost no connection....Power plants are virtually irrelevant to the oil problem — except that the huge expense involved in building new ones would draw money away from investment in effective oil savings. (1987, 27.)

Environmental groups make other criticisms of policies designed to increase consumer demand for coal. Moreover, the US Environmental Protection Agency resisted President Carter's attempts, after the second oil shock, to adopt less stringent environmental regulation with respect to the lead content in gasoline and the burning of high-sulfur fuel oil in boilers.[13] In order to avoid political conflicts and harm to the environment, politicians can choose instead to fund programs geared toward the development of new energy sources, ranging from shale oil to solar power, such as was the case during the Carter administration (see Goldman et al. 1979, 22). Such programs may, however, be more costly as a result of their experimental nature, whereas coal and natural gas are resources that the United States and Canada already have in abundance.[14]

Substitution policies may be unnecessary if oil prices are not capped but instead allowed to rise to their true market value. Economists argue that letting prices rise provides both producers and consumers with incentives to find alternative energy supplies, without the need for governments to establish costly programs to encourage their development and use.

Demand-Side Conservation Measures

Various *ex ante* policies can also ease oil shocks by reducing consumer demand. They include taxation, tax expenditures, outright grants, communications about voluntary measures, and various command-and-control mechanisms.

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[13] "Carter's New Decontrol Timetable," *Business Week*, March 19, 1979, p. 31.

[14] "The Oil Squeeze of '79," p. 51.

Taxation

The taxation of gasoline and other oil products can discourage energy consumption (see Lovins and Lovins 1987, 22). In the mid-1970s, US Secretary of the Interior Rogers Morton estimated that a 10 cent increase in the price of gasoline would cut consumption by about 3 percent in the first year and by 10 percent by the fifth year; a 30 percent increase would reduce consumption by 8 percent or 530,000 barrels a day the first year (Wellemeyer 1975, 156). Although such a policy may be an effective instrument to induce motorists to cut pleasure driving and unnecessary trips, promoting the public good of conservation, Lovins and Lovins note that "any tax on final energy products is disproportionately hard on people with low incomes, because they spend a larger fraction of their income on fuel"; in addition, drivers who can afford to buy more energy-efficient cars face less of a tax burden than "those who can barely afford the cars they have" (Lovins and Lovins 1987, 22).

Advocates of distributive justice are also likely to oppose a tax on heating oil because, again, heating expenses entail a larger proportion of the income expenditures of poor families. A solution proposed by Wellemeyer was to recycle the US$27 billion that would be collected from a 30 cent gasoline tax into tax rebates to help the poor and those who must use their cars or trucks at work or who drive long distances to their jobs (1975, 156).

Tax Expenditures and Grants

President Carter's energy plan in the United States included the provision of tax incentives for users of less-traditional energy sources. Examples entailed tax credits for the purchase of wood-burning stoves and the production of shale oil; a federal sales tax exemption for gasohol (an automobile fuel comprising 10 percent alcohol and 90 percent gasoline); and tax writeoffs for homeowners who adopted a "passive solar design" to maximize solar power, installed storm windows and doors, or insulated their homes.[15]

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[15] "Carter's Energy Plan" 1979, 19; Wellemeyer 1975, 156; Sheils et al. 1979, 26.

West Germany initiated a tax credit and grant program for homeowners in 1978 in order to promote energy conservation through the use of energy-saving technologies.

Tax expenditure policies may be popular among libertarians because they allow freedom of choice; however, they are more likely to benefit better-off citizens, possibly attracting opposition from advocates of distributive justice. First, low-income families are unlikely to have the funds to invest in activities that would qualify for a tax expenditure, such as solar energy projects. Second, as noted earlier, the least-advantaged — individuals and families with low income or without any taxable income at all — receive the least benefit from such a program. As a result, a grant program that provides funds to adopt energy-conserving measures may be preferred. However, monitoring the use of such funds is likely to be difficult, a problem that does not arise with a tax-expenditure program in which benefits are received after the conservation efforts have been achieved.

Apart from homeowners, industry may also be the recipient of grants. In 1973, subsidies were provided to the US railroad industry to promote the use of trains, which can travel similar distances as airplanes and cars with far less fuel.[16] Such a grant program may have to be combined with further incentives for passengers because channeling funds into the industry alone may be insufficient to induce individuals to select trains over other forms of travel.

Communicative Tools and Voluntary Measures

In spring 1973, in anticipation of gasoline shortages later in the year, the US federal government printed "ration books" containing information on conservation strategies, such as lowering thermostat settings and curtailing unnecessary lighting. Dewees notes that providing consumers with information about the energy-consumption characteristics of appliances helps them to make informed choices, rather than automatically select the appliance with the lowest purchase price, unaware that it consumes the largest amount of energy (1981, 118).

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[16] "America's Energy Crisis," *Newsweek*, January 22, 1973, p. 54.

To the extent that communicative tools assist in informed decisionmaking, economists are likely to support such interventionist mechanisms as long as the benefits exceed the cost of gathering and disseminating information. Moreover, such information may be a public good, which supports its provision by government.

Communicative instruments are likely to engender support from libertarians as well because individuals retain their freedom of choice. Yet, as a result of this freedom, informative instruments may prove ineffective in achieving the desired goal since changes in behavior may not be forthcoming. After the second oil shock, President Carter asked commuters to use car pools and mass transit, drivers to adhere to the 55 mile per hour speed limit, and homeowners to keep thermostats to 65°F in winter and 80°F or above in summer.[17] Energy experts doubted that Americans would voluntarily limit their indoor heating and cooling or limit the use of their automobiles; critics noted that prior attempts at voluntary measures had yielded a poor public response, perhaps because of collective-action and free-rider problems.[18] Some experts advised, "only when there are Sunday closings and mandatory conservation measures will people react" (Sheils et al. 1979, 26).

Command-and-Control Mechanisms

In an effort to "put some teeth into his plea" and trigger state action, President Carter also announced that he would set state-by-state targets to reduce gasoline consumption, with the threatened penalty for noncompliance being the mandatory closing of service stations on weekends.[19] In Oregon, after the first oil shock in 1973, state officials adopted a conservation program that included as its centerpiece a complete ban on outdoor advertisement and shop window lighting and an order for electric companies to disconnect the service of any business that violated the ban. By the end of that year, it was reported that the conservation drive had reduced energy consumption in the state by 6 percent.[20]

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[17] "Carter's New Decontrol Time Table," p. 31; Sheils et al., 26.

[18] "Carter's New Decontrol Time Table," p. 31; "Carter's Energy Plan," p. 20.

[19] "Carter's Energy Plan," p. 20.

Several European countries, including France, West Germany, Italy, and the United Kingdom, made efforts to protect oil for the industrial sector's use by placing restraints on private consumer energy demand after the first oil shock. Gasoline consumption was widely curtailed through regulations such as bans on Sunday driving, the imposition of speed limits, and reductions in street lighting and in the number of hours of television transmission (see Prodi and Çlô 1976, 100–101).

Although command-and-control mechanisms may be more effective in achieving the goal of energy conservation than voluntary measures, as was the case in Oregon, libertarians would disapprove of such regulations as they require government interference and impose constraints on individual liberty. Economists and utilitarians may also oppose such strategies because, as Horwich and Weimer note, "[d]emand restraints invariably result in substantial losses in consumer welfare, and they are difficult and costly to implement....These costs will almost always outweigh any distributional benefits they produce." For example, they point out, a weekend ban on the sale of gasoline, intended to discourage recreational travel, would also have the unfortunate side-effect of hindering business and high-priority personal travel that is more efficiently done on weekends (Horwich and Weiner 1984, 175, 177).

After the first oil crisis, the US Congress created the Corporate Average Fuel Economy (CAFE) Standards, which required that average gas consumption of all manufactured automobiles in the United States achieve a stated number of miles per gallon, regardless of consumer preferences. Failure to comply with the established ratings from 1978 onward resulted in large fines (Carter 1985, 238). Canada imposed a similar form of new fuel economy standards for cars (see Dewees 1981, 136).

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[20] "The Nights the Lights Went Out."

Critics of such a program include libertarians, who disapprove of such intervention in private business and consumer choice. They argue that a tax on fuel or vehicles could produce the same result as regulation of auto manufacturing, while avoiding excessive constraints on producer and consumer freedom. In addition, Dewees notes,

> there is nothing in CAFE to encourage reduced driving. In fact, if it leads manufacturers to produce more effective vehicles, people may actually drive more, since their cost per mile will decline. Furthermore, there are close substitutes for automobiles, such as vans and light trucks, which are subject to less strict fuel and economic standards. (Ibid., 134, 136.)

Carter also reports that CAFE was ineffective in curbing consumer consumption of fuel; General Motors complained that, despite its having designed smaller, more fuel-efficient cars, the public continued to buy large ones (Carter 1985, 238).

In brief, a tax on fuels may serve not only as a possible alternative policy but also as a more effective way of altering consumer behavior and achieving the desired goal of energy conservation.

Ex Post Policy Instruments

Some of the measures just described as *ex ante* instruments were, in actuality, put into effect after one or the other of the 1970s' oil crises. Also available were *ex post* instruments, and some of them were used at the time.

Price Controls

After the first oil shock of 1973, the United States was still producing over half of the petroleum it consumed, and the federal government considered it unfair that domestic producers should reap the benefits of undeserved, artificially high world oil prices. Hence, Congress enacted the *Emergency Petroleum Allocation Act of 1973*, which allowed for price controls (Basile 1982, 212). Communitarians are likely to support such a policy because it entails a sharing of benefits and burdens. So are advocates of distributive justice because, although price controls affect all consumers, they may benefit low-income families to a greater extent since a larger percentage of their spending is devoted to energy consumption.

On the other hand, economists such as Horwich and Weimer argued against the use of price controls, which, they believed, distorted the market and created disincentives for other forms of mitigation; for example, they said, the low prices discouraged both demand conservation and domestic exploration and production, creating shortages and deteriorating service (1984, 83; Basile 1982, 212). Sheils et al. noted, "one result of the [US price control] system is that some old wells have been capped even though they have not run dry — simply because oil companies find that the controlled price is barely enough to cover their production costs" (1979, 25). Such constraint on domestic supplies leads to a greater reliance on oil imports, creating a vicious cycle whereby the world price is bid up by the demand for imports, resulting again in domestic pressures for price controls.

Decontrol of Prices

The second oil shock brought forth a new policy of decontrol in both the United States and Canada. The centerpiece of President Carter's oil program was the phase-out of price controls on domestic oil with the twin goals of increasing supply by providing incentives for domestic production and decreasing consumption demand (see Goldman et al. 1979, 22). Carter chose a gradual approach in order "to minimize the shock to the economy that would result from lifting the lid in a single step" (ibid.). Old oil prices were permitted to rise toward the world price at a rate of 1.5 percent a month starting from June 1, 1979, and at a rate of 3 percent starting from January 1, 1980; full decontrol was allowed on October 1, 1981.

Canada also adopted a policy of price increases in 1979, in contrast to its reaction to the first oil shock, during which the federal government froze the price of domestically produced oil (see Simeon and Robinson 1990, 238). Ottawa adopted this increase, dubbed "incentive pricing," to induce the exploration of Alberta's remaining oil reserves (see Best 1981, S3).

Economic analysts generally support a policy of decontrol because of the incentives both energy suppliers and consumers face. According to *Newsweek*, the gradual decontrol of prices in the United States induced multinational oil giants and US independents to invest hundreds of millions of dollars in new exploration for oil and the development of efficient technology for extracting more crude from oil fields since expected gains were higher with the decontrol.[21] On the demand side, the US Department of Energy predicted that the higher prices would persuade numerous oil users to switch to alternative sources of energy, such as coal, natural gas, and nuclear power, and to engage in energy conservation (see Sheils et al. 1979, 25; Dewees 1981, 116). Policymakers thought an increase in supply combined with a decrease in demand for oil by consumers facing high prices would produce a substantial decline in net imports of oil. At the time the new oil program was adopted, the Carter administration predicted it would "save the U.S. nearly 1 million barrels a day of imported oil and cut $6 billion from the U.S. import bill by the mid-1980s" (Sheils et al. 1979, 24).

The need to increase supply and cut imports was dampened, however, in both the United States and Canada when the expected pattern of increases in the world oil price failed to materialize in 1982 and 1983 (see Doern and Toner 1985, 333).

A policy of decontrol is not without critics. Advocates of Rawlsian distributive justice are likely to oppose it if unaccompanied by mitigative strategies because, as noted in *Newsweek*, "the President's outright endorsement of higher prices will seem like nothing less than a blatant hide-skinning of low income groups."[22] In addition, communitarians are unlikely to support a policy that results in disproportionate benefits for domestic oil-producing companies, which gain from price increases, and burdens for consumers of oil, who lose from decontrol. In order to appease such critics and to garner widespread support for his energy program, President Carter proposed softening the impact of decontrol by taxing away half the resulting "huge and undeserved profits" from the oil companies and recycling them into activities such as grants to the hardest-hit poor, expanded mass transit, and the cultivation of new sources of energy (see Goldman et al. 1979, 22). Thus, the White House was able to line up support from various groups, including liberals, urban interests, the elderly, and some businesspeople.[23] In Canada, the governing Progressive Conservative Party introduced a similar 50 percent windfall tax on increases of more than C$2 per barrel (Doern and Toner 1985, 6).

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[21] "America's Own Oil Boom," *Newsweek*, September 29, 1980, p. 65.

In addition to Rawlsian and communitarian rationales, efficiency considerations may make such concessions desirable. As we discussed in Chapter 3, Levmore notes that, when new losers can block change, government may have to provide them with compensation to prevent their efforts to impede the enactment of what seem to be efficient new policies (1999, 7–8).

Levies and the Taxation of Windfall Gains

Doern and Toner note that the Carter administration received political support for the passage of its energy windfall-profits tax bill from consumers who were outraged by the large profit increases domestic oil industries were garnering in the face of oil shortages. Nonetheless, getting the bill passed was still a struggle; the president himself acknowledged that "oil companies can be expected to fight to keep the profits which they have not earned" (ibid.). In Canada as well, the domestic oil industry was displeased with the Conservatives' 50 percent windfall tax (Doern and Toner 1985, 6).

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[22] "America's Energy Crisis," p. 59.

[23] "Carter's Energy Plan," p. 20.

Some utilitarians and advocates of economic efficiency may have opposed the tax because they feared it would subtract substantially from companies' exploration funds: "[t]he actual loss in exploration funds would be much greater than the loss in tax dollars" (Heise 1974, A8). For example, Mobil Oil Canada reportedly stated in response to windfall taxation that its active exploration programs in frontier areas would have to be reviewed to determine whether they could be continued (ibid.). Libertarians, in general, may also oppose the taxation of domestic oil profits as unwarranted takings from shareholders (see Gilbert 1991, 6). This primacy of liberty, rights, and autonomy in libertarianism can coexist with great inequality (Arthur and Shaw 1991, 114).

On the other hand, the decontrol of oil prices unaccompanied by some form of redistributive taxation is likely to violate Rawlsian distributive justice and communitarian rationales. Advocates of the former can support the taxation of windfall profits if the revenue is distributed in a manner that benefits the disadvantaged, and communitarians can approve of it if the revenue is used to satisfy a sharing of burdens and benefits.

Grants and Rebates

As noted above, the Carter energy plan entailed aid to mass transit and the poor, policies supported by both communitarians and advocates of Rawlsian distributive justice. It was estimated that approximately US$200 million would be channeled into mass transportation in the form of aid to localities and rehabilitation of railroads, promoting energy conservation by providing alternatives to the frequent use of automobiles (see Sheils et al. 1979, 25). Such measures would aid communities as a whole. In addition, during the first year of the program, an estimated one-third of the tax revenue would be rebated to poor families with yearly incomes below

US$7,800 to help them cope with the higher cost of energy; the grant would amount to an average of US$100 per four-member family (ibid.).

Conclusion

The oil shocks case study reinforces the lesson of our study of floods: policies that do not address the root problem but rather deal only with the consequences of a shock on an *ad hoc* basis create future costs and can exacerbate the impact of a particular shock. During the first oil shock, governments attempted to rely on price controls to mitigate the shock's effects. The problem with such a strategy is that it dampens market forces that would otherwise operate to limit the effects of the shock. In particular, allowing oil prices to increase tends to spur exploration, encourage the discovery of new sources, and promote conservation efforts that could mitigate the effects of the shortage; keeping prices low through artificial controls diminishes these incentives. After the second oil shock, however, stringent price controls were eschewed for a policy of decontrol in conjunction with increased taxation of domestic oil revenue and the recycling of tax revenue into social works and assistance. Both price controls and the taxation of oil companies' profits on inframarginal oil accompanied by assistance for the poor are likely to satisfy communitarians and advocates of distributive justice because each of these mechanisms produces a sharing of benefits and burdens. In general, if intervention is to occur, there may be reason to favor the strategies implemented after the second oil shock.

Another lesson imbedded in both the oil shocks and floods case studies is the risk that broadly targeted programs may assist those who are not in significant need. If the intervention following the second oil shock was motivated by a desire for distributive justice, it is worth noting that price controls are only crudely targeted to this goal. Poorer people are probably hit proportionally harder by high oil prices than wealthier people. Widespread price controls, therefore, do help the poor more than the wealthy. However, price controls act to keep prices low for all purchasers, not just those in need. Thus, taxation and redistribution may be a more effective tool of distributive justice.

The study also reinforces the observation that the relationship between the type of shock and the normative rationale for intervention is important. Market shocks do not suggest intervention to those concerned about economic efficiency, given that their view tends to the conclusion that markets will do a better job than governments in mitigating the effects of a shock. On balance, advocates of economic efficiency are disposed to rely on the incentives provided by high prices to increase supply and to develop alternatives. Communitarians and distributive justice advocates, however, may see the case for intervention as compelling. Whether economic dislocation is caused by the market or a flood, they believe that if utility can be increased by bettering the lot of the lesser off or, in the case of advocates of Rawlsian distributive justice, the least well off, relief ought to be pursued. On some issues, the conflict between normative approaches is considerable and not easily reconcilable, as the oil shocks demonstrate.

7

Market Shock Case Study 2: Agricultural Commodity Price Volatility

Agricultural commodities are subject to price fluctuations, including extreme depressions, that are often considerably greater than those for other goods. The explanation is a combination of demand- and supply-side factors. Demand for many agricultural commodities tends to be relatively inelastic (insensitive to price) because consumers view them as staples with few good substitutes. Thus, if output increases significantly, the result is a decline in prices that must be substantial to clear the market, given that relatively fixed demand. Conversely, if output falls significantly, prices are likely to increase very substantially. That relatively fixed demand will chase the reduced supply, which, in the absence of government intervention, will be rationed through sharp increases in prices.

On the supply side, the output of many agricultural commodities is susceptible to unpredictable factors such as weather and disease. In addition, some analysts claim that many agricultural markets, because of low exit and entry barriers, tend to exhibit "cobweb" or "hog-cycle" effects (Ezekiel 1937). For example, when the price of corn is high, farmers exit wheat production and go into corn production, in due course causing a glut in the corn market and a depression in prices, followed by a return to wheat production. Switching back to wheat lowers the price in this market while corn prices rise with exit, inducing in due course re-entry into corn production, a glut, and a collapse in prices, *ad infinitum*.[1]

One must distinguish the combined effects of variable output and inelastic demand on agricultural commodity prices on the one hand, and on farmers' incomes on the other. In periods of sharp reductions in output, prices may be very high, so net income may rise for farmers with output to sell, but fall for those with little to sell. Conversely, in periods of substantial increases in output, prices may be very low, so net income may go down even for farmers with a great deal of output to sell.

Yet although prices and incomes may be volatile for many agricultural commodities, farmers often face a high ratio of fixed to variable costs (for example, debt-service costs on land and equipment), so they have little ability to adjust costs in the face of changing prices. Thus, a single bad year may well see many farmers' being put out of business altogether, although, in some sense, they have an ongoing comparative advantage in producing the commodities in question (that is, they are efficient producers). Even if a given farmer is an efficient producer but is already heavily indebted, lenders facing information asymmetries may be reluctant to provide a loan to help him with liquidity problems, and the farm's failure may result.

For these reasons, agricultural industries are subject to significant volatility and price fluctuations that have potentially disastrous implications for individuals operating in the sector. In this chapter, we examine the basis for government intervention to alleviate the impact of these shocks.

Normative Rationales for and against Intervention

The normative rationales for government intervention in volatile agricultural markets are roughly those we have been considering since Chapter 3. Those most often voiced rest on norms of economic efficiency, distributive justice, and communitarianism.

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[1] Whether the cobweb theory accurately describes farmers' behavior is contentious, as it appears to assume either poor information or substantial irrationality if these price and output patterns have regularities to them.

Economic Efficiency

An efficiency perspective leads to the following question: Given the objective of stabilizing farm prices and incomes, why do we not observe private sector arrangements evolving to meet this demand? (See Trebilcock et al. 1982, 95–99.) To some extent, of course, we do. For example, we see crop insurance being written, and we see active markets in certain kinds of agricultural futures (pork bellies, corn, wheat, and so on). On the other hand, if an unmet demand beyond this exists for some kind of insulation from the vagaries of market prices in agricultural sectors, why is it not being met?

The three classic reasons for the failure of insurance markets are moral hazard, adverse selection, and correlated risk. These factors may explain the absence of more extensive insurance markets in the present case.

The moral hazard factor implies that a farmer whose income is insured against all future contingencies has less incentive to do all that is reasonably within his power to generate income. Thus, an insurance contract would need to specify the conditions under which payouts would occur, including conditions pertaining to planting, irrigation, fertilization, disinfecting, weeding, and so on. Moreover, an insurer would need to invest resources in monitoring compliance with these conditions. Moral hazard may also help to explain why lenders are reluctant to advance funds to a farmer already heavily in debt when there is a price shock: if he succeeds in making the farm profitable again, much of the benefit will accrue to the lenders; thus, the more debt he owes, the lower are his incentives to make the farm profitable.

The adverse selection factor implies that income insurance creates incentives for persons who are especially high risks to seek insurance. Again, an insurer would face substantial transaction and information costs in attempting to segregate applicants for insurance into various risk classes so as to eliminate the adverse selection factor. And it would imply elements of cross-subsidization and excessively high premiums for other classes of insureds.

The correlated risk factor means that, given the vagaries of weather and price, many farmers in the same geographical area are likely to face low prices simultaneously, making it difficult for insurers to diversify their risk.

For these reasons, private sector insurance markets may not be able to provide farmers with adequate insurance against future economic shocks. Of course, the existence of commodity and futures markets provides some potential for hedging risks, but since at least smaller farmers may lack the capacity to access these markets, risk diversification strategies may, in practice, be quite limited.

An efficiency perspective does not, however, necessarily call for government-provided insurance in response to the limitations of private risk markets. The factors that undermine private insurance are also significant problems for any publicly provided insurance.

More generally, any government intervention that alleviates the plight of farmers in times of output shocks may have inefficient dynamic effects on the agricultural industry. For example, highly inefficient farms may survive because of subsidies during down cycles. And subsidies are likely to lead to investment in farming that is excessive from an efficiency standpoint. Thus, an efficiency perspective does not provide a compelling case for government intervention in the form of effectively subsidized insurance or otherwise.

Distributive Justice

The image of a family's losing its farm, and therewith a lifetime of work together, as a result of price or output fluctuations remains a powerful and poignant image in popular culture, even though much of the agricultural industry in developed countries today comprises large commercial producers (Trebilcock and Howse 1999, ch. 10). Considerations of distributive justice may favor some form of state intervention to ameliorate the plight of small, struggling family farms. Utilitarian considerations may militate in the same direction provided that the form of intervention does not involve costs or disutilities to the underwriting taxpayers or consumers that exceed the benefits to the family farming recipients. This calculus may not be simple. Given that many agricultural commodities are staples, incorporating the costs of intervention into their price is likely to have a regressive impact on low-income consumers.

Communitarianism

From a communitarian viewpoint, a common argument for intervention in agricultural markets is that rural communities would disappear or lose their distinctive character if economic activity in the countryside were shifted away from agricultural production. A closely related argument is that keeping land and people in farming is a social good in itself. The implicit assumption about land is that, but for agricultural use, the countryside would be much more heavily burdened with ugly, polluting industries, be replaced by industrial or commercial towns, or simply become depopulated. Writing primarily of the Canadian context, Wilson and Finkle suggest:

> Farmers enjoy an undercurrent of sympathy among urban voters which confers political power on them quite out of proportion to their numbers....[M]ost urbanites are attracted to the idealized image of the countryside: the hard working farm family, the noble virtues and traditional values which they imagine motivate their rustic compatriots. It is not a lifestyle most urbanities would care to live themselves, but they are glad someone is doing it and they are willing to pay a bit to see it maintained. (1990, 204.)

Europeans, in particular, are fond of arguing that their countryside is a natural and cultural treasure that would be fundamentally threatened if land is taken out of agricultural production.

Another communitarian argument focuses on self-sufficiency and national security. In times of shortage, access to imported food may dry up, as foreign countries impose export restrictions to ensure that their own populace is fed first. This argument may provide rationales for measures to maintain agricultural production in a country, even though efficiency would generally require that most or all of its needs be met from imports. A variant on the self-sufficiency argument is the purported advantage of not having the supply of basic foodstuff depend on foreigners who may be the country's enemy (or potential enemy) in war.

Ex Ante Policy Instruments

In many countries, the agricultural sector has been the subject of extensive state intervention, reflecting in part the rationales for intervention as described above and in part the influence of powerful farm lobbies, which often exert political influence disproportionate to their numbers because of the way local electoral boundaries and political representation are designed. *Ex ante* intervention has typically taken the form of various kinds of supply-management schemes (in the Canadian context, agricultural marketing boards) that attempt to limit total production of the commodity in question and assign farmers individual quotas that are often tradable. In order to protect these domestic regulatory arrangements from being undermined by import competition, countries may adopt highly protectionist trade policies involving import quotas or tariffs. In some cases (for example, the European Union's Common Agricultural Policy), these arrangements are supplemented with export subsidies to clear domestic surpluses. In other cases, farmers are the recipients of direct or indirect government subsidies designed to reduce various classes of their costs.

Various alternatives to marketing boards are possible. For example, some jurisdictions have introduced pooled pricing arrangements. In strong markets, a board acting as buying agent for producers buys produce from farmers at less than the rate at which it can be resold in the market, with the difference being pooled (Hoos 1979). In weak markets, the board pays farmers a price for their produce exceeding what it can realize on the open market, the difference being financed out of previous retentions. On the face of it, such a scheme has the advantage of leaving the ultimate market for the produce to work without interference while pooling the risks of fluctuations. However, the administrators of a pooling arrangement face moral hazard and adverse selection problems similar to those of private insurance markets, with parties entering the scheme when payouts begin but leaving it when contributions are called for. It seems unlikely that such a scheme can be put into operation without substantial supporting regulations specifying contribution obligations and payout qualifications. In addition, a pooling scheme geared toward leveling divergences in market prices from some specified benchmark may be poorly adapted to cope with climatic conditions that result in an undersupply of produce that sells at high prices but, because of the shortage of supply, yields very low incomes. In other words, payouts geared solely toward adjusting the market price of produce realized by a farmer may be only weakly responsive to reducing variations in his income.

Many of these same difficulties seem to arise with regulatory arrangements involving the maintenance of buffer stocks (in weak markets, an agency buys produce from farmers at a formula price and then runs down the inventory in strong markets — thus, in effect, acting as a state-sanctioned futures broker). In the absence of supporting regulation to restrict production in weak markets, such a scheme is likely to be financially extended by an obligation to "buy in" all quantities of the produce in question that might be offered at above-market prices.

Once government decides to further a stabilization objective by intervening in a segment of the agricultural sector, it is difficult to see how it can stop significantly short of the kind of arrangements commonly observed — namely, some variant of marketing boards empowered to regulate both prices and output plus trade restrictions.

Normative Rationales

From an efficiency perspective, state-sponsored price or income stabilization programs appear to involve unavoidably substantial elements of redistribution whereby farmers do not face the full social costs of providing themselves with the "insurance" they enjoy, a situation that encourages entry into and discourages exit from the agricultural industry. The moral hazard and adverse selection costs of the insurance are shifted to other cost bearers, such as consumers or taxpayers. Stabilization of farm incomes as an objective of agricultural marketing boards (and similar forms of state intervention) thus manifests not an efficiency motivation but rather a distributive rationale — the enhancement of farmers' incomes through redistribution from consumers or taxpayers. Agricultural lobbies may encourage citizens to perceive the objective of marketing boards in terms of pure stabilization but, for the most part, such a view is illusory.

A distributive justice perspective yields a more realistic view. But one can reasonably ask: How good are marketing boards at achieving this objective? (See Grubel and Schwindt 1978; McManus 1978.) In many respects, they exhibit serious shortcomings. First, it is extremely difficult to set out criteria that identify precisely the target class of beneficiaries under the scheme. If that target is some intuitive notion of "struggling family farmers," how is the intuition translated into policy? If policymakers settle on an income ceiling, how can one be sure that farmers falling beneath it are not there as a matter of conscious choice (hobby farmers, back-to-the-land health devotees, and so on) or simply highly inefficient producers who possess resources that could be used much more efficiently in other ways?

Second, if the target class can be defined in a practical way and the benefits of the program confined to that group, questions then arise as to what the beneficiaries must do to continue to qualify. Suppose they stop producing altogether or fail to incorporate the most efficient production techniques available. Do these failings mean discontinued participation in the program?

Third, are the initial beneficiaries allowed to trade their rights to benefits, such as production quotas, to other parties (at a price) on the sale of their property, irrespective of whether the transferees would, in their own right, qualify under the program? Even if transfers are confined to the same target class, the possibility of trading quotas is likely to lead to early capitalization of the benefits, and subsequent entrants will receive a normal rate of return, unenhanced by any effective subsidy (Tullock 1975). One result may be continuing demands for escalation in the scale of the subsidies (although if the subsidies come from marketing boards and monopoly profits, only one level of output can maximize group profit). On the other hand, not to allow trading of quotas sharply reduces the holders' incentives to invest in improving their properties.

Thus, marketing boards are likely to generate both allocative and distributional effects at variance with their avowed policy purposes of stabilizing or enhancing the income of family farmers. Less-efficient forms of production are encouraged. The benefits are often conferred on large farmers as well as small ones, are transitory, and are financed regressively by both poor and rich consumers.

Communitarians encounter even more dismal realities about intervention in agriculture. Even very high levels of protection have not saved the family farm; rather, the percentage of the rural population in Canada and many other countries has fallen dramatically over recent decades. Moreover, the price-support systems in place fail to distinguish small family farmers from large industrial farms, for which support is less suited to the communitarian rationale for intervention. With respect to rural lifestyle values, careful regional development plans seem a more finely tuned instrument than agricultural protection to ensure balanced economic activity in the countryside.

All of these considerations suggest that marketing boards as a form of intervention in agricultural markets are a very blunt and crude instrument for achieving their avowed goals. Moreover, when one analyzes the alternative regulatory instruments, it is clear that each exhibits major shortcomings as a method of enhancing farm incomes.

Economists generally prefer that regulatory transfer instruments be replaced by a system of direct cash subsidies financed out of general tax revenues. However, an ongoing or recurrent cash subsidy scheme, without quotas or other forms of entry restriction, would lead to undesired entry by producers who are seeking to take advantage of the program. Moreover, the problems that arise with marketing boards — in defining qualifying criteria for those already in the market and in specifying conditions to be complied with for the receipt of benefits — would also arise under a cash subsidy program.

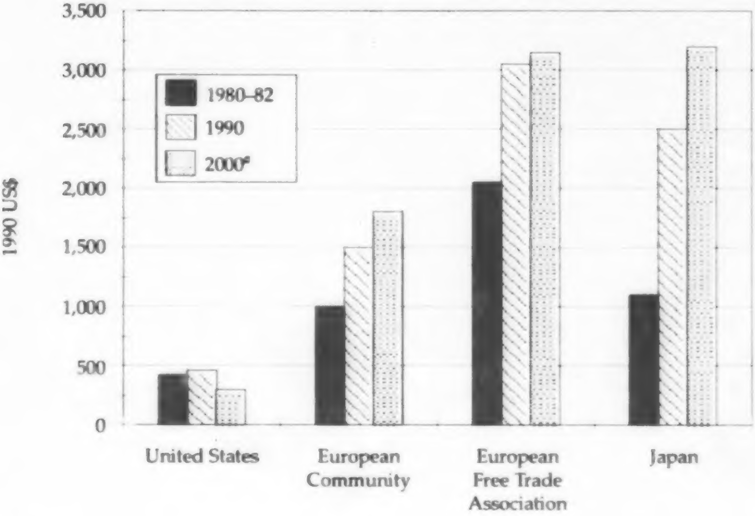
The Costs and Benefits of Protection

Recent years have seen many estimates of the costs and benefits of domestic and international agricultural protection, using different methodologies and different definitions of what constitutes protection (see Trebilcock and Howse 1999, ch. 10). The costs include the expense to taxpayers of on-budget measures, such as export and domestic subsidies; commitments to purchase surpluses; the costs to consumers of more expensive food; and losses of allocative efficiency as resources are misdirected to agricultural production where no comparative advantage exists in the farm sector. The International Monetary Fund (IMF) estimates that agricultural protection has cost taxpayers and consumers in the countries of the Organisation for Economic Co-operation and Development (OECD) alone about US$300 billion each year. The IMF also finds that liberalization of this sector, involving both trade and domestic policy reforms in these countries, would result in gains to consumers and taxpayers far outweighing losses to agricultural producers.

Figure 1, taken from a 1992 survey of agriculture by *The Economist*, contains estimates of the annual per household costs of agricultural protection in the United States, Western Europe, and Japan (including both higher taxes and higher food prices). These costs, which average around $1,400 for the countries concerned, are considerable. And to them must be added the environmental costs of overfarming due to incentives to increase production and the deadweight loss of resources devoted to lobbying for protection.

The effects of protection on farmers' incomes in various countries, including industrialized and developing countries, are displayed in Figure 2. The gains to farmers in the European Union and

Figure 1: ***Cost of Agricultural Support per Nonfarm Household, 1980–2000***



[a] Forecast.

Source: "Grotesque: A Survey of Agriculture," *The Economist*, December 12, 1992, p. S7.

Japan are clearly very large. But as *The Economist* notes, since any gains from protection are proportional to the amount produced, small or poor farmers receive only a small percentage of the gains, and highly efficient, large industrial farms capture the lion's share.[3] These gains do not, however, easily translate into the purported social benefits from agricultural protection discussed above. First, where prices for various commodities have been supported domestically, that protection has led to increased instability in world prices as surpluses have rapidly developed. This result, in turn, makes domestic price support increasingly costly and inefficient as the price mechanism is further suppressed. Second, the support has not precisely targeted distributive goals because large industri-

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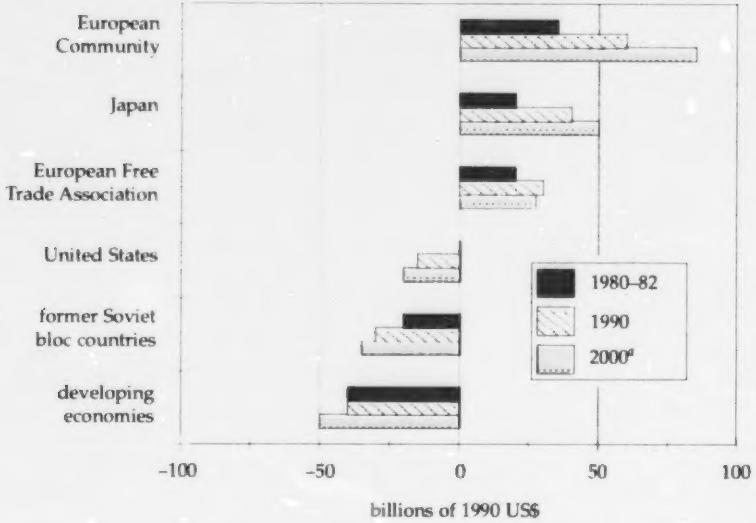
[3] "Grotesque: A Survey of Agriculture," *The Economist*, December 12, 1992, p. S7.

Figure 2: ***Effect on Farmers' Income of Rich Countries' Agricultural Protection Policies, 1980–2000***



[a] Forecast.

Source: "Grotesque: A Survey of Agriculture," *The Economist*, December 12, 1992, p. S7.

al farms and family farms receive proportionately the same benefits, and the former get more in absolute terms. Third, even very high levels of protection have not saved the family farm — the exodus to the cities continues because increased efficiency means that fewer farmers can produce more. Finally, agricultural protection does not appear to have prevented environmental and esthetic degradation in rural areas; indeed, overfarming with intensive use of fertilizers and other chemicals has begun to contribute significantly to environmental degradation, especially in Europe.

The Uruguay Round Agreement on Agriculture made a modest start on reducing traditional forms of agricultural protection (Trebilcock and Howse 1999, ch. 10). Domestic support is to be quantified in terms of a common metric and be subject to mandatory minimum reductions amounting to 20 percent over a six-year peri-

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od, with 1986–88 as the base period. Export subsidies are to be reduced over the same six years by 21 percent in terms of the volume of agricultural products that receive such subsidies and 36 percent in terms of total cash value; existing nontariff border measures such as quotas, are to be converted into tariff equivalents. Each member country is to reduce tariffs by at least 36 percent overall over the six-year phase-in period, with a minimum 15 percent reduction on each product category. Notwithstanding these commitments, agriculture will remain one of the most protected sectors in many countries of the world.

Ex Post Policy Instruments

Although agricultural support typically takes the form of *ex ante* intervention through marketing boards and the like, alternative *ex post* instruments are also occasionally used. After a period of very low prices has developed in a particular sector, governments may choose to intervene by providing farmers with "emergency" cash payments to help them survive the crisis. Recently in Canada, for example, low agricultural prices led the federal government to provide such payments to farmers who had suffered significant declines in income. In 1996, the federal and provincial governments agreed to give Canadian farmers up to C$1.5 billion in emergency aid (*Toronto Star*, December 11, 1996). The money was dispensed over two years to farmers who had been hit the worst by plunging prices for farm commodities, such as hogs and grain. Help was provided where a farmer's gross margin — a measure of farm income — fell to less than 70 percent of an average of the last three or five years. The assistance would bring the gross margin back up to the 70 percent level.

Many of the problems that plague *ex ante* crisis intervention also arise with *ex post* instruments. Critics focused on efficiency think that the payments may have the effect of keeping inefficient producers in business. Anticipation of benefits may lead farmers to continue raising a particular product even if they foresee low prices and incomes. Thus, the payments may encourage inefficient entry into a produce market and discourage efficient exit.

From a distributive perspective, cash payments are likely to target only crudely those farmers truly in need. The recent cash payments in Canada, for example, were based on individual farmers' recent income history. Farmers with higher recent incomes who had suffered a 30 percent drop received more than farmers with lower recent incomes. Such a system may fail to distinguish struggling family farms from industrial farms. The same observation undermines any communitarian rationale for intervention. It is noteworthy, however, that the Ontario government capped aid to any individual entity at $40,000, perhaps improving the distributional impact (*Toronto Star*, January 19, 1999).

Conclusion

Agricultural price volatility provides another context that reinforces conclusions drawn from other case studies. Stopgap measures can exacerbate the impact and cost of shocks. Bailing farmers out when prices decline tends to raise sharply the number of farms in operation, increasing the impact of future price volatility, which, in turn, may call for further intervention. Also, widespread relief programs risk failing to target sufficiently the true objects of intervention. If, for example, intervention is justified on a communitarian or distributive justice basis, the object ought to be to ameliorate the plight of small family farms. Empirically, however, cash payments have been made on the basis of criteria (such as the change in a farmer's income, rather than the level of income and the change combined) that only loosely target the intended beneficiaries.

A study of responses to agricultural price volatility raises another important conclusion. Notwithstanding the scale of rural aid programs, the full-time family farm appears to be disappearing. As Trebilcock and Howse (1999) note, much of the agricultural industry in developed countries comprises large, commercial producers. Even if the goal of intervention in the face of price volatility is to preserve communities, it may be that politically feasible intervention is simply insufficient to stem the market forces that are leading to the widespread commercialization of agriculture. In such situations, it is questionable whether policymakers, even those concerned about community, should continue to expend resources in resisting the inevitable.

Indeed, we are not convinced that price volatility in the agricultural sector (any more than in many other sectors, including natural resource commodities) normatively justifies extensive forms of state intervention. The only exception is the transition costs entailed in withdrawing existing forms of protection. Such transition costs could entail assistance to those who are harmed by the presence of subsidies elsewhere, perhaps to allow communities to survive a transition period, but this approach should be viewed as an interim measure pending negotiation of effective international constraints on subsidies.

8

Government Shock Case Study 1: *The East Coast Cod Fishery*

The fishery has long been Atlantic Canada's most important industry. In 1991, it was responsible for 100,000 jobs, $3.1 billion worth of production, and 20 percent of the gross provincial product (GPP) of the region (Harris 1998, 131). The fishery provided 20 to 25 percent of Newfoundland's employment throughout the 1980s (ibid., 117, 155). The collapse of the North Atlantic cod fishery in 1992 and 1993 devastated coastal communities and the region's economy as a whole. Dozens of outport communities lost their economic underpinnings; numerous commercial buildings and local businesses whose fortunes were tied to the fishery are empty (DeMont 1993b, 15). Over 40,000 fisheries workers lost their jobs, the vast majority in Newfoundland, which historically has had the highest unemployment rate in Canada (Bergman 1997, 30). In 1991, the average unemployment rate in Newfoundland was 18 percent; in 1992, the year the moratorium on cod fishing was announced, that rate rose to an average of 20.2 percent and remained around this level for the following two years (Statistics Canada 2000, 35). Those unemployed face large obstacles to re-employment as few alternatives exist in the region, and minimal education, which plagues most displaced fisheries workers, makes finding other work difficult.[1] In addition, many fishermen have large amounts of money tied up in boats and equipment for the groundfishery; recouping it will be difficult if alternatives are not readily available.

Harris and others argue that "inshore fishermen were entitled to expect Ottawa's financial support" (1998, 65), reasoning that the federal government must be held accountable for its mismanagement of the North Atlantic fishery. On June 4, 1976, Canada's minister for external affairs announced that the country would establish a 200-mile exclusive economic zone off the Atlantic coast as of the beginning of the next year (Burke and Brander 1995, 73). However, even with this reduction in fishing by foreigners, serious domestic overcapacity still existed, and it remained unaddressed. Indeed, the federal Department of Fisheries and Oceans (DFO) permitted further domestic expansion. Shrank describes Ottawa's behavior as driven by "policy schizophrenia," whereby it was never able "to determine whether its chief goal [was] to set and implement policy for the fishery as a viable industry or whether it [was] to maximize employment and save non-viable rural communities" (quoted in Harris 1998, 78–79). Harris argues that the latter goal was clearly the path chosen: "The department kept pumping out licences with little regard for the marine environment or the state of the stocks" (ibid., 67). Between 1970 and 1981, Ottawa subsidized 35 percent of the costs for the construction of replacement fishing vessels. In addition, the Newfoundland Department of Fisheries subsidized 30 percent of the costs of fishing gear in order to assist small-boat fishermen to acquire the latest technology. These subsidies contributed to the explosion in the number of registered inshore fishermen in Newfoundland from 13,738 in 1975 to 33,640 in 1980 (ibid., 69).

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[1] The Newfoundland government reports that, among the participants in The Atlantic Groundfish Strategy, the federal government's compensation package, 41 percent had less than grade 9 education and 70 percent had not completed high school. Only 10 percent of recipients had formal training beyond high school. (Newfoundland 1997.)

In fall 1986, the Newfoundland Inshore Fisheries Association (NIFA) funded an independent technical audit of the DFO's method of stock assessment. The resulting Keats report concluded that "the 1986 DFO stock assessment had seriously over-estimated the size of the northern cod stock" (as summarized in ibid., 98). In the same year, Dr. George Winters, head of the Pelagic Fish, Shellfish, and Marine Mammals Division of the Newfoundland Region of the DFO, also presented a paper concerning federal stock assessments. He surmised that "recent failures in the inshore fishery could be explained by heavy overfishing of the northern cod stock offshore, based on bad scientific advice for prudent TAC [Total Allowable Catch] levels" (as summarized in ibid., 101). Harris himself notes that Winters' paper was never published as a DFO research document, and few outside the department were aware of its existence until 1997 (ibid., 101).

In 1987, federal fisheries minister Tom Siddon appointed a commission headed by Dr. Dayton "Lee" Alverson from Seattle, Washington, to study the northern cod stock. Again, the findings of the report indicated that DFO stock assessments had been incorrect. Alverson stated that the problem had been caused by errors in the interpretation of some survey information and the use of a faulty mathematical model. When asked who was to blame for such mistakes, Alverson pointed his finger at Ottawa: "You have to blame it on the government who've been reticent to make effective and timely decisions" (quoted in ibid., 103–104). The view that Ottawa's short-term socioeconomic concerns about the fishery superseded concerns about the cod stocks was reinforced by the DFO's increasing the 1988 TAC to 266,000 tonnes, a 10,000 tonne rise, despite Alverson's recommendations to maintain the 1987 TAC level as a minimum management response (summarized in ibid., 106).

A fourth committee, chaired by Dr. Leslie Harris, completed its work in 1989 and confirmed that the northern cod stock was in grave trouble. While acknowledging the difficulties inherent in conducting a fish census in a vast area of open ocean, Harris found fault in the "disastrous advice given to managers and politicians by the DFO's science branch" (Canada 1990, 122). Its task force noted, in its report to the DFO, that "failure to take appropriate steps to reduce current levels of fishing mortality will probably lead to a significant continuing decline in the spawning population [of northern cod]" (quoted in Lavigne 1995). The response of fisheries minister Bernard Valcourt and trade minister John Crosbie (who would later become fisheries minister) was to reject the Harris task force's scientific advice and to refuse to decrease the TAC. Crosbie said "Harris doesn't have to deal with the economic, social and cultural effects of reduced quotas. I do" (quoted in Lavigne 1995). In an article in the *Sou'Wester*, a fishing industry newspaper published in Yarmouth, Nova Scotia, Captain Wilfred Bartlet, vice-president of the NIFA, condemned the politicians for their shortsightedness: "It's the same old political game that is being played — when people are concerned or kick up a little stink, appoint a commission to look into the problem and when the report is finished, ignore the findings" (quoted in Blades 1995, 118). He criticized Crosbie for being more concerned about jobs in the short run than the conservation of the fish stocks (see Harris 1998, 203).

Blades and Harris both argue that the fear of short-term political costs was the driving force behind the continued delay in dealing with the long-term viability of the cod industry. As Harris notes, "with few or no local employment alternatives, and forced migration an unpopular last resort, politicians tended to let a bad situation get even worse" (ibid., 71). In addition, as Blades reports, "despite evidence that...high catch rates were suppressing stock growth, a series of fisheries ministries, under duress from fishermen's groups and lobbying from powerful offshore companies, often set quotas at levels above those recommended by scientists" (1995, 111).

Government scientists who were part of the Canadian Atlantic Fisheries Scientific Advisory Council, responsible for setting fishing quotas, have also been faulted for overevaluating the recovery of the northern cod stocks after 1977 and for fixing the F factor (the percentage of exploitable biomass), which determines the TAC, at an unrealistically high level throughout the 1980s (ibid., 85). The Harris report of 1990 stated that the DFO scientists "do not appear to have appreciated the full implications for cod mortality of new technologies and new fishing practices employed by both domestic and foreign fishermen" (quoted in ibid., 86). Moreover, the political environment in which government scientists had to operate was also cause for concern. In a February 1994 speech on scientists and cod quotas, given at the Environment and the Economy Symposium at Dalhousie University in Halifax, David Suzuki stated:

> I know for a fact that they are frustrated and demoralized because they see their scientific research being massaged to fit [a] political agenda.... And I know that there are DFO scientists who have known for years that there is a crisis in the groundfishery but who have been frustrated by the political structure within which they exist. (Quoted in ibid., 129.)

In 1991, fishermen were able to catch 127,000 tonnes of cod, only two-thirds of the year's TAC of 190,000 tonnes. Finally, in July 1992, after years of denial and inaction, John Crosbie, then federal fisheries minister, announced a two-year moratorium on northern cod fishing, which was extended indefinitely in 1994. In 1993, moratoriums were announced for the south coast as well. In a paper published in 1994 in the *Canadian Journal of Fisheries and Aquatic Sciences*, DFO research scientists Jeffrey Hutchings and Ransom Myers wrote: "[W]e conclude that the collapse of northern cod can be attributed solely to overexploitation." Those affected by the closures largely blame the federal government for its slow response to the impending crisis. Former Newfoundland premier Clyde Wells asserts that the main reason for the collapse of the Atlantic fishery is federal mismanagement:

> I don't mean to say the province is lily white in it. We've done things. We've promoted building of new plants, increased the number of boats and all that sort of thing, so we contributed to the pressure on the fish stocks. There's no question about that. But even there, don't forget it was done on the basis of federal scientists saying, "Get more plants, get more boats, you're going to

> have a TAC of 400,000 tonnes by 1985." That was the federal line that was followed. (Quoted in Harris 1998, 173.)

For these reasons, this chapter treats the depletion of the cod stocks as resulting from governmental negligence in managing the stocks.

Normative Rationales for and against Intervention

In cases of government-caused shocks, as with other types of economic shocks, one can look to various kinds of norms for reasons for and against intervention in the market. We emphasize that it is government mismanagement, not the depletion of the cod stocks *per se*, that constitutes the shock for the purposes of this discussion.

Economic Efficiency

The efficiency arguments in favor of government intervention in the face of the depleted cod stocks are three. First, as in the cases of the floods discussed in a previous chapter, public intervention may be justified by the fact that private insurance markets are imperfect in their coverage for government negligence. Cohen notes:

> Given the inexperience of insurance companies with running governments, the costs of acquiring information about the enterprise whose activities are associated with the risks it is expected to insure, and the costs of monitoring the insured's activities, the failure of a private insurance market to develop fully is not surprising. (1990, 228.)

The provision of public insurance would mitigate risk-averse individuals' inability to obtain private insurance to cope with the risk of a shock resulting from government mismanagement.

The second, related problem is correlated risk. Numerous losses occur simultaneously from the impact of the government shock, making it difficult to spread the risks involved and resulting in an unprofitable enterprise for private insurers. Government would be the better risk bearer because it can spread costs over an entire population of taxpayers.

Third, compensation programs may serve to deter government from behaving negligently in order to avert a public insurance payout. Indeed, liability generally may be desirable as an efficient deterrent mechanism. Calabresi, in discussing private accident law, argues that the internalization of the prospect of tort liability would force those engaged in injury-generating activities to choose a level of production that promotes allocative efficiency (1970, 69–73). Cohen extends this efficiency argument to the public realm. Currently, the socioeconomic impact analysis employed by the federal bureaucracy does not include risks of legal liability associated with state action as a regulatory risk (Cohen 1990, 234). Imposing liability for negligent behavior might cause policymakers to internalize the costs of their negligence.

This theory presents two problems, however. The first, as Cohen notes, is the difficulty involved in actually implementing such liability rules in the public realm. Public sector cost-benefit analyses differ markedly from those in the private sector; the former include such variables as income distribution and regional balance, technological progress, market structure and competition, international competitiveness, and inflation. Consequently, the courts have difficulty concluding that a government has been negligent "unless we are willing to accept the reviewing institution as a super-government" (ibid., 239).

The second problem is that bureaucratic liability rules may not serve to deter inefficient government behavior if the public choice model plausibly describes that behavior. The assumption behind the public choice model is that politicians' principal objective is one of self-interest: to maximize their chances of election or re-election. As a result, they face incentives to confer benefits on politically influential pressure groups, such as the offshore fishery, and important voter groups, regardless of whether outcomes are economically efficient (see Quinn and Trebilcock 1982). As Harris notes with respect to the cod industry, "scientists and bureaucrats failed as managers while politicians were more interested in their own short-term futures than in the long-term survival of the fish"; no politician was prepared to accept the consequences of restricting entry to the fishery (1998, 81, 69). This incentive to capitulate to interest groups is exacerbated by the observation that the implications of liability in the public realm differ vastly from those in the private sector. In the public realm, assuming the absence of constraints on taxation, all losses that courts impose on government can be shifted to taxpayers. Thus, Cohen asserts, "liability rules will have no impact on the behaviour of bureaucrats, and will merely generate substantial transaction costs as wealth is shifted from one group of (tort) victims to a second group of (tort law) victims" (1990, 258–259). Levmore (1999) observes, on the other hand, that such a strategy of loss-shifting may result in political opposition from taxpayers.

Another argument against government compensation for those affected by the fishery closures is that the expectation of payment weakens such parties' motivation to anticipate change and to take action in order to mitigate the adverse effects (ibid., 6). DeMont notes that long before the moratorium was announced, inshore fishermen were complaining of dwindling catches and smaller fish (1993b, 14). However, if fishery workers are aware that compensation packages will be awarded in the event of an economic shock in the industry, they will have less incentive to take precautions such as diversifying their skills and developing alternatives to the fishery.

Libertarianism

As discussed throughout this study, libertarians generally advocate a minimal state role and thus are likely to reject large-scale government compensation packages. With respect to the Atlantic cod fisheries, however, some libertarians may approve of government's taking responsibility for this crisis. The importance that they place on avoiding harm to other individuals can support an argument for compensation in corporate mismanagement cases, and perhaps this approach can be extended to public mismanagement cases.

Although numerous scholars, such as Trebilcock (1993, 61), have criticized the "harm principle" on the grounds that it provides little specification of what "harm" entails, one can argue that the harm imposed on former fisheries workers from negligent management of cod stocks passes the threshold. Barbara Neis, a sociology professor at Memorial University of Newfoundland in St. John's, notes that, in addition to losing their source of income, "[w]ithout fishing, these people lose their sense of pride and the thing which gives them a true sense of identity" (quoted in DeMont 1993b, 15).

Distributive Justice

A utilitarian distributive view, although contestable, may justify compensation to victims of cod fisheries mismanagement. The vast number of displaced fisheries workers may garner an increase in utility greater than the disutility suffered by federal taxpayers, who, though greater in number, must fund the compensation program. Even if this were not the case, Rawlsian distributive justice could also serve as a rationale for government intervention; the numerous unemployed fishermen and plant workers may indeed be considered to be among the least advantaged as there are few employment alternatives within the region or nationwide, especially for those with limited education and skills.

In addition, the quota cuts and the moratorium have more severely affected small, inshore fishermen than the large, offshore companies. Blades notes that, through the rationalization of plant operations and the move toward frozen food processing, the offshore companies "have successfully adjusted to the hardships created by resource depletion and have shown they are not disabled when the sustainability of stocks is undermined" (1995, 173). Inshore fishermen, who do not have the capital and resources to be as flexible as the corporations, have been unable to adapt and, consequently, have been hit harder by the quota cuts (see ibid., 143). Thus, supporters of Rawlsian justice may advocate state intervention to assist the least advantaged within the fishery itself.

Corrective Justice

Corrective justice may serve as a rationale for compensation in cases of public negligence. In the case of the fishery, the consensus, noted in the House of Commons fisheries committee report of 1998, is that "the federal government itself is in large part responsible for destroying the northern cod stock," leading to the suffering of a vast number of displaced fishermen and plant workers.[2] As Bergman notes, "those displaced by the cod moratorium deeply resent what they see as Ottawa's mismanagement of the fisheries" (1997, 30). Corrective justice can be used as a justification here to support compensation for the sufferers paid by the government, the doer.

As a matter of tort law in Canada, whether liability can be found in this context is unclear. The jurisdiction of the courts to impose liability on the federal government is founded in federal legislation, the *Crown Liability Act*, which permits the courts to find the state vicariously liable for the torts committed by its servants or agents (Cohen 1983–84, 411). In *Kamloops v Nielsen* (1984), the Supreme Court of Canada adopted the two-stage *Anns* test to establish government liability.[3] As articulated by Supreme Court Justice Wilson, the test is as follows:

> [I]n order to decide whether or not a private law duty of care existed, two questions must be asked:
>
> 1. is there a sufficiently close relationship between the parties (the local authority and the person who has suffered the damage) so that, in the reasonable contemplation of the authority, carelessness on its part might cause damage to that person? If so,
> 2. are there any considerations which ought to negative or limit (a) the scope of the duty and (b) the class of persons to

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[2] "Bar foreign boats, MPs urge: Fisheries committee blames Ottawa for cod collapse, wants bureaucrats removed," *Globe and Mail* (Toronto), March 5, 1998, p. A1.

[3] The *Anns* test for duty of care liability was established in 1977 in the United Kingdom in *Anns v Merton London Borough Council*. It has since been overruled in the UK courts but has still been used in Canada.

> whom it is owed or (c) the damages to which a breach of it may give rise? (*Kamloops v Nielsen* [1984], 10 DLR [4th] 641.)

As Cohen notes, the second stage of the *Anns* test requires explicit judicial assessment of the policy considerations relevant to a decision to expose the government to, or insulate it from, legal responsibility (1992, 218). The use of this test was maintained in *Just v Queen in the Right of British Columbia* (1989), where the court emphasized that policy decisions, as opposed to administrative actions, should be exempt from liability such that governments are not restricted in making decisions based on social, political, or economic factors (689).

In 1993, fishermen in Nova Scotia, organized under the Inshore Fishermen's Bonafide Defence Fund, took the federal government to court claiming that had it heeded early warnings and taken decisive action by the mid-1980s, the cod stocks would not have collapsed and a subsistence inshore fishery could have been maintained. The legal action was dropped in early 1994 for technical reasons — the Nova Scotia Supreme Court ruled that the organization's membership list did not contain a significant cross-section of the inshore sector and thus did not sufficiently represent it (Blades 1995, 143). Whether such a case would have otherwise been successful is uncertain because complexities may arise with respect to the second stage of the *Anns* test. If Ottawa had made a deliberate policy decision to maximize employment in Atlantic Canada at the expense of conservation, the courts might have chosen to insulate the federal government from liability for its decision. Cohen notes, however, "some judges have indicated that an activity or decision will be unlawful if the decision was so unreasonable that no reasonable person could hold that the statutory object would be furthered by the decision" (1983–84, 416). One could argue that such was the case here; in consistently failing to observe conservation goals, the goal of employment was eventually and inevitably subverted. Newfoundland Premier Brian Tobin, federal fisheries minister when The Atlantic Groundfish Strategy (TAGS) compensation program was announced in 1994, summed it up well: "The federal government mismanaged the fishery horribly. The result is that thousands of people were displaced. Can Ottawa then wipe its hands and say, 'Well, that's that'?" (quoted in Bergman 1997, 31).

Communitarianism

Communitarians see the individual as incomplete and unintelligible outside social relationships and social context; in other words, an individual's identity and life decisions are determined largely by community and group membership (Brittan 1998; Loewy 1991, 55). Communitarians are strong advocates of government compensation to assist the numerous coastal communities that have been devastated by the collapse of the cod stocks. As Human Resources Development Canada reports, "[m]any of the communities most affected by the groundfish moratorium...are not well-placed to compete for business, either provincially, nationally or internationally, in anything but the fishery sector" (Canada 1998b, 7).

The result has been the shrinking of communities as an increasing number of people, particularly the young, are forced to migrate due to a lack of alternatives in the region. Between 1991 and 1996, many communities experienced a net decline in population of well over 20 percent, and in some cases well over 30 percent (ibid., 4). The small town of Burgeo, on the south shore of Newfoundland, shrank from 3,000 residents to about 1,800 in a decade (Cox 1997, 3). The departure of the young has created concerns that a large number of small communities will be left populated by senior citizens, with shrinking tax bases and no succeeding generation to manage municipal affairs and services (Canada 1998b, 5). Communitarians are likely to support government compensation programs in order to stem this out-migration and to preserve coastal communities. Many displaced workers are themselves unwilling to leave: "[T]hey have deep roots in their communities and are reluctant to leave their homes for an uncertain future in other parts of the country" (Cox 1997, 2). Communitarians criticize the operation of the market, which may eventually result in relocation to places where labor is in demand, because it fails to account for the full social costs of the fracturing of community. "[N]o means exist for evaluating the loss to the community resulting from the departure of a valued family member, church goer, and citizen. The market has therefore grossly understated the full social costs attendant upon his leave taking" (Gilbert 1991, 98).

Ex Ante Policy Instruments

When the Atlantic cod fishery collapsed, the federal government was managing the cod stocks through the use of yearly quotas. Given Ottawa's apparent failure in managing this common property resource, we can usefully examine possible management alternatives in order to avert the possibility of government failure in other fishery industries.

Vernon notes that the bureaucratic determination of quotas could be combined with individual "marketable catch quotas" as proposed by Pearse (1992), whereby the allocation of the annual total catch quota would be determined by the market, rather than by a regulatory bureaucracy (Smith 1985, 416). In New Zealand, for example, the fishery quota management system centers around "individual transferable quotas" (see Pearse 1992, 77), with the result that overexpanded fleets have rationalized themselves voluntarily, without government intervention. In addition, fishermen who wish to take advantage of economies of scale have been purchasing the rights of others. With this transfer of quota assets, Pearse notes, property rights are better defined and self- regulation can then be a possibility: "Once those who share the rights to the resource are clearly specified to the exclusion of others, and their shares in it are defined, the stage is set for them to take on management responsibilities" (ibid.).

Command-and-Control Mechanisms

Command-and-control regulations provide legal restrictions on the discretion that public and private decisionmakers may exercise. Cod fisheries analysts have expressed mounting concern that politicians did not follow scientific advice and that scientists' work was manipulated to suit a political agenda. In 1997, George Baker, Liberal Member of Parliament for Gander-Grand Falls, Newfoundland, suggested that, if scientific evidence was, in fact, being ignored, Canada should adopt legislation making it illegal for governments to overrule scientific advice (Harris 1998, 320), a recommendation the House of Commons fisheries committee chose not to endorse after investigating the policies and practices of the DFO. However, the committee's primary and contentious recommendation called for the removal of senior bureaucrats in the DFO who "are viewed by the fishing community as being responsible for the crisis in the fishery."[4] There is no doubt that, if the removal of government officials (on the basis of their dismissal of scientific advice, for example) were institutionalized, it would serve as a deterrent to officials from engaging in risky policy behavior. Although such an approach might deter negligence, it could also deter sensible but risky policy directives.

Mandating the removal of negligent bureaucrats might also alleviate public choice concerns because individuals and groups would be less likely to lobby an agency such as the DFO if they knew in advance that legal constraints would prevent its responding in the desired manner. However, the result might be merely to divert lobbying efforts toward agencies that are in charge of establishing those legal constraints; pressure groups might instead turn to Parliament to amend legislation against, for example, the dismissal of scientific evidence.

Although libertarians generally oppose command-and-control mechanisms because of their limitation of choice, they may support them when such regulations are used to constrain the state from acting (see Stone 1989, 208).

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[4] "Bar foreign boats."

Civil Liability

As already noted, the prospect of government liability for mismanagement may be beneficial if it encourages government officials to internalize the costs of inefficient outcomes, consequently deterring such behavior. In addition, it satisfies notions of corrective justice. As also noted earlier, however, the courts, aware of their limited institutional competence to review cost-benefit analyses carried out by government, may hesitate to review the behavior of public officials "unless we are willing to accept the reviewing institution as a super-government" (Cohen 1990, 237–238). Moreover, the courts are unwilling to constrain government policy decisionmaking based on social, political, and economic factors. Consequently, government policy decisions are likely to be insulated from liability in accordance with the case law discussed above under corrective justice.

In addition, individuals wishing to bring actions against government face large costs in time and money, as well as legal, technical, and scientific uncertainties regarding the outcome of possible litigation (Cohen 1983–84, 435). Moreover, class action rules in many provinces are very restrictive. Thus, if compensation is left to the courts, there may be only a minimal number of people who would bring suits, leaving the majority without any form of redress. Finally, as noted above, it is not clear that liability on the part of "government" generally will affect decisionmakers within government.

Community Management Facilitation

Harris notes that groups of fishermen have been approaching the DFO to ask for a "local community management board" whose decisions they would agree to abide by as a group (1998, 326). The concept has already been implemented in seven groundfish industry areas in Nova Scotia and, despite some disagreements, has worked well. The boards set plans that took into account the effects of member fishermen on one another, thus promoting efficiency through the internalization of such externalities. Limitations and constraints on how members operated were voluntarily imposed, an approach libertarians support (ibid., 326). Blades notes that fishermen are more likely to follow voluntarily regulations that they have worked to develop than those imposed from outside (1995, 174), although such a strategy may encounter collective action problems.

Diversification of the Economy

The fishery has gone through vast changes since the decline of the cod. Unexpected yet welcome growth in the shellfish sector has helped to mitigate some of the hardship caused by the fisheries closures (Newfoundland 1997). Auld says, "thanks to Newfoundland's efforts to diversify the industry to species such as crab, scallops and shrimp, employment at fish plants is at its highest since 1989" (1999, J1). Others note, however, that the shellfish industry will not provide the same level of employment as the traditional fishery sector. Currently, the promotion of the shellfish sector has mainly assisted large offshore companies; the shrimp that have appeared do not go near the shore, and only well-financed companies can afford massive factory ships that go out for months at a time (Toughill 1998, A6). Advocates of distributive justice may support providing small-boat fishermen with subsidies for shellfish equipment to allow them to take advantage of the shellfish industry.

The diversification of the fisheries, though limited, underlines the fact that governments may choose to encourage diversification of a region's economy by subsidizing some industries, perhaps through publicly sponsored worker retraining programs.

In 1992, Newfoundland Premier Clyde Wells announced a plan to promote homegrown enterprises, as well as the tourism, culture, and high-technology sectors. The federal TAGS program included financial incentives to induce people to move out of the fishery sector: an employment bonus for individuals who found work outside of the fisheries that paid less than their weekly income support (but no less than the provincial minimum wage); a wage subsidy for employers outside the fisheries to induce them to hire TAGS participants and provide on-the-job training; and self-employment assistance (52 weeks of financial aid plus entrepreneurship training and technical support) for eligible participants interested in starting their own businesses outside the fisheries (see Newfoundland 1997). Such diversification, if successful, would be beneficial by making the region less dependent on one industry and thus less vulnerable to public mismanagement. Some scholars are, however, skeptical about the success of such approaches; one economist commented: "Making Newfoundland some sort of high-tech centre is just wishful thinking" as its roots and identity are embedded in the fishery (quoted in DeMont 1993b, 16).

Ex Post Policy Instruments

The primary federal government compensation package for those displaced by the collapse of the cod fishery has been the TAGS program.[5] (We explore the individual components of the package in greater detail later.)

TAGS was introduced on April 19, 1994, as a $1.9 billion initiative to be implemented in May 1994 and intended to last five years. The purpose of TAGS was to provide income support and labor market adjustment programs — largely skills development and training — to fishermen, plant workers, and trawlers affected by the Atlantic groundfish crisis (Newfoundland 1997).

To qualify for TAGS, an individual had to have worked two six-week periods in the fisheries between 1990 and 1992 and to have met unemployment insurance requirements (from any source of income) in any two years during that same period (Harris 1998, 206). The result was that more than 40,000 workers, rather than the projected 26,500, applied and qualified for assistance. Consequently, funds were dispensed at a faster pace than projected, and the program ended in August 1998, eight months earlier than planned. In addition, in order to sustain the program's funds, the federal government announced in July 1996 that money earmarked for training and buyouts would be directed toward straight income support (Bergman 1997, 31; Newfoundland 1997). Unfortunately, as a result of this shift, "TAGS has been a dismal failure at reducing the number of people dependent on the fishery" (Harris 1998, 315).

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[5] TAGS was neither the first nor the only compensation program Ottawa provided for displaced fisheries workers. The Northern Cod Adjustment and Recovery Program (NCARP), introduced in August 1992, was effectively an extension of unemployment insurance benefits. For details on this program and several others, see May and Hollett (1995, 84–89).

Income Support

The federal government implemented income support measures to deal with the immediate needs of people whose means of employment and income had been severely limited or severed altogether by the closure of the cod fisheries. Fishermen received an average of $344 per week and plant workers received an average of $273 per week (DeMont 1993b, 14).

Advocates of distributive justice are likely to approve income support programs because such policies are intended to benefit low-income households. In July 1996, TAGS eligibility was tied to an income ceiling of $26,000 (Harris 1998, 207). Before then, however, TAGS payments had no restrictions based on income, and Revenue Canada and the TAGS administrators did no cross-checking. The result was that many benefits were distributed to individuals and households with high incomes. At one point, it was reported that income support had been paid to some crab fishermen from Prince Edward Island who had earned over $200,000 for a few weeks of work (ibid.), which led to the establishment of an income ceiling in 1996 and to more careful monitoring.

Communitarians support income maintenance programs because they help to maintain communities and avoid disruption from the otherwise necessary departure of those rendered unemployed without local employment alternatives. This outcome is, however, precisely why economists oppose income support initiatives. Inshore fisherman Tom Best maintains that "as long as the government was going to pay direct compensation to out-of-work Newfoundlanders, they would have no incentive to leave the fishery" (quoted in ibid., 211). The 1997 report of the Auditor General of Canada came to a similar conclusion:

> The report said that instead of restructuring the industry 'to make it economically viable and environmentally sustainable,' TAGS had encouraged people to stay in the fishery. The level of financial support was also found to be a disincentive to work since it paid more than a minimum wage job. (Quoted in ibid., 318.)

The disincentives to move out of the industry have been accompanied by the creation of an ingrained sense of dependency on the federal government. As Demone notes, "the nice emotional thing about TAGS is that it rescued these people financially and put bread on the table. But it also created a terrible dependency....Now there's thousands of people who really think that the government should look after them" (quoted in ibid., 317). Consequently, by the end of March 1997, only 0.5 percent of TAGS recipients had voluntarily left the program, far below Ottawa's forecast of 50 percent (ibid., 319).

After TAGS was terminated in August 1998, Ottawa introduced a $790 million replacement program that included lump-sum payments, community development funds, and buyouts of fishing licenses and equipment.[6]

Retraining

The federal government initially allotted TAGS funds for training activities, such as literacy, community-based adult basic education, university study programs, leadership, career guidance, and entrepreneurship. The programs were geared to provide clients with opportunities to acquire new skills or gain work experience that could assist them in finding alternative employment (Newfoundland 1997). As noted above, however, Ottawa announced in July 1996 that, because the funds were being rapidly used up, training programs, except those already in progress, would be terminated.

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[6] "End of an Era as TAGS Program Folds," *CBC Newsworld*, August 29, 1998. From Internet website: newsworld.cbc.ca/archive/html/1998/08/29/tags980829a.html; accessed August 1, 1999.

The Newfoundland Department of Finance reports that about 50 percent of TAGS clients participated in these programs, including employment interventions, training, and counseling (ibid.). Harris notes, however, that, of the 10,000 Newfoundlanders who upgraded or took training under TAGS, about 6,300 were still unemployed as of March 1997, and of the 7,387 who took an institutional course, 5,870 remained unemployed (1998, 249). Nonetheless, the results were positive in some communities, such as Isle Madame, Nova Scotia, where half the TAGS recipients were retrained and found employment outside the industry, including at a telephone call center set up by an Ontario company (ibid., 318). Many younger people in the region as a whole have benefited from the retraining programs and have found work in fields as diverse as hairdressing and oceanography (see Cox 1997, 3).

To the extent that retraining programs are run efficiently and effectively and assuming that some individuals face monetary constraints and are unable to afford retraining without assistance, economists may support such government programs because they facilitate the movement of workers to areas with labor demand, reducing dependency on the state for income support. Retraining may also be desirable from a utilitarian viewpoint, because taxpayers benefit from lower long-run expected costs of income support.

The difficulty with retraining programs is that, although they are popular among the young, who are willing to leave home to find work, older people largely resist them. Having worked in the fishery for decades, many are unwilling to give up the only life they have known; others feel they are simply too old to be retrained. Says Albert Johnson, a 55-year-old fisherman from Catalina, Newfoundland: "I've been fishing for 20 years. I am not going to learn how to operate a computer for a living at this stage" (quoted in Demont 1993b, 15; see also Cox 1997, 2–3; Bergman 1997, 31). In addition, Tom Best, President of the Association of Newfoundland and Labrador Fisheries Co-op, notes: "The vast majority think the fishery will come back...So it's very difficult to get them to take advantage of government paid training opportunities right now" (quoted in Blades 1995, 160).

Currently, training is voluntary and Human Resources Development Canada reports that the majority of those consulted in Newfoundland and Labrador believe it should remain so since training should not be wasted on unwilling participants; libertarians support such a view (Canada 1998b). Respondents also think that training should be geared toward finding employment, even if this entails leaving the community or the province. Communitarians, on the other hand, advocate efforts to create jobs within the community. Moreover, if the young are the ones most willing to leave and retraining is geared to promote mobility, then communitarian fears of a growing number of communities populated largely by senior citizens may prove to become a reality. Advocates of distributive justice may also criticize such a development because they may consider the elderly to be the least advantaged, left in isolated and poor communities, whereas the young benefit from retraining and new employment elsewhere.

Relocation and Mobility Assistance

TAGS also provided financial assistance, on a monthly basis, to help with job-search activities, house hunting, housing expenses, and relocation costs once a permanent job was secured (see Newfoundland 1997). The evaluation is much like that above on retraining. From an efficiency perspective, providing individuals with incentives to move to areas with job demand may be welfare enhancing if these people would otherwise be unwilling or unable to relocate due to community ties or financial constraints. From a communitarian perspective, however, such incentives are undesirable because they are geared toward exit from the community.

License Buyouts and Early Retirement Packages

The Groundfish Licence Retirement Program, announced in August 1992 and administered by the DFO, offered fishermen monetary compensation for surrendering their groundfish licenses and permanently leaving the fishery. The program involved a process whereby individual fishermen submitted a bid for the amount they would like to receive for their license; successful bidders received a lump-sum payment for the full amount awarded. By 1997, a total of $45.2 million had been spent on the program in Newfoundland and Labrador, and a total of 394 fishermen had retired their licenses (Newfoundland 1997).

Human Resources Development Canada notes that plant workers and others believe that the fairest way to reduce the number of fishermen and plant workers is to provide early retirement packages based on age and years of experience. They criticize TAGS' early retirement scheme for not adequately taking into consideration years of experience in its eligibility requirement. The result was that many who had worked in a plant for only five years were eligible for an early retirement package simply because they were old enough, whereas others who had 25 or 30 years' experience did not qualify as they did not pass the age threshold. A scheme that took into account both age and experience would likely be more equitable (see Canada 1998b).

A federal government report (Canada 1998c) suggested that, with the termination of TAGS, Ottawa should focus more on license buyouts and early retirement packages for fishermen, rather than on income subsidy payments. The report felt that fishery workers in Atlantic Canada were becoming less optimistic about the return of the cod stocks and thus wanted lump-sum payments, rather than monthly cheques.

Economists may also prefer such an approach, although it entails high costs in the short term, because it eliminates the need for long-term dependency on government and the possibility that an indefinite amount of income support payments could eventually surpass the compensation needed for early retirement packages. Libertarians may also prefer early retirement packages because Ottawa can withdraw once the lump-sum payment is made and avoid the ongoing involvement necessary for monthly income support payments.

Conclusion

The collapse of the cod fishery undoubtedly was one of the most disturbing events in recent Canadian economic history. The difficulty with trying to prevent shocks induced by government mismanagement lies in the question of how to regulate government. Command-and-control legislation may be an effective tool in controlling the behavior of particular agencies, but agency officials are likely to resist such constraints on their power and freedom of choice. Civil liability is a complex avenue of deterrence: courts are often reluctant to review the actions of government; as a result of this uncertainty and the high costs of litigation, individuals may be unwilling to bring suits. Given the difficulty of regulating government, it may be prudent to focus instead on the political necessity of compensation packages and better *ex ante* regulation of common property resources. Given that most east coast fishermen and plant workers blamed the federal government for the collapse of the groundfishery, it would have been politically disastrous for Ottawa to have refused to provide assistance. The main package the government offered, The Atlantic Groundfish Strategy, cost close to $2 billion. Should such a compensatory program set a political precedent, it may serve to deter government from negligent resource-management decisions in the future. In addition, corrective justice rationales may also call for government assistance to compensate the sufferers.

The relief provided in the aftermath of the government shock involved a combination of income support, retraining, alternative employment assistance, and license buyouts and early retirement packages. Income support, while necessary in the short term, may induce long-term dependency on the part of recipients, creating disincentives for efficient adjustment and extending government involvement and thereby garnering the disapproval of both economists and libertarians. The east coast cod fishery case study further demonstrates that stopgap measures such as income support in response to a shock may exacerbate the effects of the shock, in this case by inhibiting the shift of workers out of the fishing industry. On the other hand, retraining and employment assistance, which economists are more likely to advocate, are criticized by communitarians on the grounds that such instruments are largely geared toward the relocation of individuals and consequently the fracturing of communities. A middle path may be a program of buyouts and early retirement packages. Such programs provide recipients with the resources to remain in their communities without creating long-term dependency on government. Another alternative is for the provincial and federal governments to provide incentives for individuals and companies to invest in economic activities in the region. TAGS did give assistance to local entrepreneurs, but the provision of financial incentives, such as tax credits, to invest in Atlantic Canada could extend to businesses outside the region. Recall that a telephone call center set up by an Ontario company now provides employment for a large number of individuals in Isle Madame, Nova Scotia. If successful, such a strategy would allow communities to remain largely intact while providing alternative employment for those displaced.

9

Government Shock Case Study 2: *Trade Liberalization and Transition Costs*

Since governments set policies for foreign trade, the need for domestic adjustment to them can be considered a kind of government-induced economic shock, and possible remedies can be examined under our taxonomy of perspectives.

From the perspective of neo-classical economics, trade restrictions have little to commend them, theoretically or empirically. By restricting the available contract-opportunity set, trade barriers force societies to forgo mutual gains from exchange and specialization. As a matter of simple economic theory, the gains to domestic consumers from foreign trade are almost always greater than the gains to domestic producers from purely domestic trade. The reason is that, when domestic prices are higher than foreign prices, there is a transfer of resources from domestic consumers to domestic producers (arguably creating matching decreases and increases in welfare); *in addition*, some domestic consumers are priced out of the market by the higher prices and forced to allocate their resources to less-preferred consumption choices, entailing a dead-weight social loss.

The cost to consumers for each job saved by trade protection typically far outweighs the average compensation per worker in the industry affected (Trebilcock, Chandler, and Howse 1990, 42–76).

To cite some examples, protecting the US specialty steel industry cost Americans US$1 million per year for each job preserved when the average annual compensation for those jobs was less than US$60,000. Consumers of automobiles in the United States paid US$160,000 per year for each job saved through protection when the annual compensation in the industry was less than one-quarter of this amount (Crandall 1984). In Canada, the statistics are similar. Consumers of footwear were "taxed" through trade protection between C$53,668 and C$69,460 per job saved when the annual compensation for a worker in the industry was C$7,145; consumers of textiles and clothing paid C$40,600 to C$50,982 per year for each job saved when average earnings were $10,000; and consumers of automobiles paid C$179,000 to C$226,394 per year for each job saved when the average compensation in the industry was C$29,000 to C$35,000 (Economic Council of Canada 1988, 61, 70, 76).

These statistics make apparent the significant gains to be had from liberalizing trade. Richardson argues, however, that, in evaluating such gains, any dynamic analysis must take account of two kinds of social costs: dislocation costs and adjustment costs (1980, chap. 10). *Dislocation costs* entail the output of goods or services sacrificed from any unemployment, temporary or otherwise, of labor and other resources caused by trade liberalization. Given the usual wage and input price rigidities, at least in the short run, markets do not clear instantaneously in response to changes in the terms of trade, and resources are likely to be rendered idle. *Adjustment costs* entail resources sacrificed to retrain labor, retool machines, refurbish factories, redevelop land, and relocate the factors of production that trade liberalization causes to be redeployed intra- or intersectorally.

Richardson argues that dislocation and adjustment costs "can be fatal to the economic welfare case for trade liberalization" (ibid., 321). Although we are skeptical about this statement (see Banks and Tumlir 1986, chap. 3), it is clear that the dislocation and adjustment costs associated with trade liberalization may be significant. It is thus an important question whether, even assuming trade liberalization increases social welfare on balance, governments should intervene in order to compensate those hurt by such a change.

The concern with adjustment costs caused by changes in trade patterns or policies has long antecedents (see Trebilcock, Chandler, and Howse 1990, chap. 1, from which much of this case study is drawn). The General Agreement on Tariffs and Trade (GATT), from its inception in 1947, has provided for safeguard relief (Article XIX) through the temporary reinstatement of previous tariff concessions if foreign imports are causing severe disruption to a domestic industry.[1]

Interest in national adjustment assistance policies sharply intensified in the 1970s for a number of reasons: the two oil price shocks and accompanying recessions; the rise of Japan and other newly industrializing countries as major international trading powers; and further trade liberalization as envisaged by the Tokyo Round of GATT tariff reductions and codes restricting the use of various nontariff barriers to trade. In an environment of economic stagnation and increased import competition, many governments in western industrialized countries sought strategies that would, in various degrees, restore international competitiveness to established industries through rationalization or modernization, achieve international competitiveness in new "growth" industries, and ease exit costs for capital and labor in industries whose comparative advantage was perceived as permanently lost. Alternatively, industrialized countries adopted defensive policies designed to protect domestic industries from the effects of international competition. These concerns persisted into the 1980s and early 1990s, intensified by deep, worldwide recessions in the early years of both decades.

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[1] This provision itself was borrowed from similar provisions in previous bilateral trade treaties. The Treaty of Paris, which established the European Coal and Steel Community in 1951 to promote the integration of coal and steel production in western Europe, contemplated various forms of "orderly" adjustment in furtherance of this goal. The Treaty of Rome, which established the European Economic Community in 1957, provided for a social fund to help workers adjust to liberalized European trade. In the United States, the *Trade Expansion Act of 1962* provided for assistance to firms and workers to ease adjustments to tariff concessions agreed to in the Kennedy Round of multilateral trade negotiations. In Canada, the Canadian-American Automotive Agreement of 1965 (the auto pact) provided for forms of adjustment assistance to firms and workers affected by the agreement. The General Adjustment Assistance Program, which Canada adopted in 1968, provided adjustment assistance to firms under import pressure as a result of Kennedy Round tariff cuts (Banks and Tumlir 1986, chap. 2). These and other early examples of programs designed to address the adjustment costs of trade imports were generally not widely used, in part because of the high growth rates that characterized most industrialized economies throughout the 1950s and 1960s.

Further trade liberalization came about as a result of a number of regional trade pacts, including the Canada-US Free Trade Agreement, the North American Free Trade Agreement (NAFTA), Europe 1992, and the Australian-New Zealand Closer Economic Cooperation Treaty, as well as the Uruguay Round of multilateral negotiations, economic liberalization in the Soviet bloc and China, and the globalization of capital markets. All of these developments increased the speed of the capital reallocation process and the volatility of exchange rates, suggesting that many countries continue to confront significant adjustment pressures and the correlative challenge of choosing appropriate adjustment policy responses to those pressures.

Normative Rationales for and against Intervention

In some sense, governments cause the shock of trade liberalization, and various normative perspectives may call for government action to address such a shock.

Economic Efficiency

As the statistics above suggest, an efficiency perspective strongly supports trade liberalization. A separate question, however, is whether efficiency considerations suggest that government should intervene on behalf of those who suffer private dislocation and adjustment costs.[2] There are efficiency arguments both favoring and opposing such assistance.

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[2] Henceforth, for the sake of conciseness, we use the term "adjustment costs."

Compensation for losses resulting from trade liberalization, whether because of a decline in the value of industry-specific capital (human or otherwise) may create inefficient incentives. As Kaplow (1986) points out, if individuals anticipate compensation for losses suffered from a change in government policy, they have little incentive to act in ways to mitigate these losses. Thus, even if firms anticipate that trade liberalization will have harmful effects on their business, they may continue to make industry-specific investments knowing that they will be compensated for them. Anticipation of compensation creates inefficient investment incentives.

On the other hand, compensation may prove necessary to avoid derailing trade liberalization through the intense lobbying efforts of freer trade's losers. Because of the relatively diffuse beneficial effects of freer trade on consumers generally and the relatively focused harmful effects on firm owners and workers, public choice theory suggests that intense lobbying by focused anti-free-trade interest groups may jeopardize trade liberalization. Promising compensation to those harmed by trade liberalization may act as a "bribe" that smoothes the political transition to a more efficient trade regime. Inefficient investment incentives engendered by compensation may be tolerated in pursuit of efficient liberalization.

A common form of intervention, as we discuss below, is to compensate workers through subsidized retraining schemes or income support. Although the considerations of inefficient investment incentives and efficient "bribery" pertain to these programs, other, idiosyncratic considerations also apply. In terms of economic efficiency alone, it may seem unclear why government ought to compensate trade-dislocated workers. Kaplow (1986) argues strongly that, from this perspective, the case for compensation for regulatory change (of which trade liberalization is one example) is uncompelling in the absence of convincing proof that markets are incapable of allocating the risks of such changes.

In fact, however, there are inherent limits to the efficient, private, *ex ante* allocation of the risk of job loss from trade liberalization. Making sound predictions about the nature and extent of this risk is very difficult. As a consequence, although worker self-insurance through personal savings undoubtedly exists, such savings are likely to be too high or too low, given lack of good information about risk. Private insurance markets simply do not exist. Their absence cannot be explained by the presence of basic public unemployment insurance in most industrial democracies since it is unclear why a market for supplemental benefits does not exist. (Public insurance benefits cover only a portion of income loss and, in some countries, for only relatively short periods.)

An additional explanation for the absence of private insurance is, arguably, the quite severe moral hazard problems involved. Full insurance of the risk of dislocation due to trade liberalization would likely lead some workers and firms to take greater risks or to underinvest in precautions (such as skills diversification) against the risks.[3]

A further possibility is the contractual allocation of risk between employer and employee through bargaining for minimum notice periods and severance payments in the event of dislocation. Such notice periods are indeed the subject of bargaining in some subset of cases, but there is empirical evidence that the existence and nature of such provisions are poorly correlated with the actual risk of dislocation in the industry and region in question. This lack of correspondence suggests that serious information failures may plague *ex ante* allocation of these risks through contractual bargaining between employer and employee (Howse and Trebilcock 1993).

In addition, workers often find difficulty in addressing the risk of dislocation through *ex ante* diversification of their skills. Indeed, many face powerful incentives to specialize increasingly in firm-specific knowledge and skills that usually have larger payoffs in promotions and bonuses. Naturally, firms themselves are likely to invest most heavily in training programs that involve highly firm-specific skills. They have little incentive to train workers to be able to move to other sectors or firms; indeed, they may well have a disincentive to do so since the longer a worker stays with a firm, the greater is that firm's return on its investment in the worker.[4]

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[3] These possible market failures do not, of course, suggest that government is any better at *ex ante* allocation of risks of job loss from trade.

A somewhat different economic efficiency rationale for adjustment policies stems from the real danger that, absent government intervention, trade-induced worker dislocation may result in an erosion of human capital. Workers who lose their jobs due to freer trade or other structural changes may, out of desperation and in the absence of retraining assistance, seek employment at lower wage levels and in occupations of lower skill and labor productivity. Empirical evidence suggests that a significant percentage of dislocated workers end up in lower-wage, lower-skill occupations and, in fact, never regain the earnings levels of their previous employment (Glenday, Jenkins, and Evans 1980, 50–55). Worse still, a protracted period of unemployment — especially one uncushioned by adequate income support — may also entail physical and mental illness, family breakup, alcoholism, and drug use, which, in addition to creating added costs for various social safety nets, are almost certain to reduce the productive capacity of workers and reduce the chances that they will return to the workplace, leading instead to dependence on the social welfare system.

All of these factors are likely to be aggravated by the problem of sour grapes (Elster 1983) or adaptive preferences: the longer workers are unemployed or underemployed, the less likely they are to believe in their own inherent capabilities and hence actively to seek better opportunities (Leana and Feldman 1992, chap. 3). In sum, the *human* effects of dislocation on workers and their families may well lead to long-term suboptimal development of workers' capacities, absent positive adjustment measures.

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[4] Of course, if the firm is a conglomerate encompassing a wide range of economic activities, it may have an incentive to provide training that is not narrowly job specific, with a view to moving workers between diverse activities within the firm. Yet, even in this case, it is far from clear that, in the absence of a long-term employment contract or an implicit contract (such as company loyalty in Japan), workers would not often take their newly acquired skills and apply them elsewhere.

Workers affected by trade liberalization should, however, have private incentives to retrain; if the cost of retraining is exceeded by the benefits, social and private incentives should align. Yet liquidity problems may imply that workers find it difficult to finance retraining. This challenge supports subsidized retraining from an efficiency perspective only if capital markets have some imperfection that hinders efficient investment in human capital. The difficulty in providing security for loans against human capital, for example, may limit the ability of workers to seek financing for retraining.

Distributive Justice

Two paradigms that we have invoked throughout this study are utilitarianism and Rawlsian distributive justice. Utilitarianism does not distinguish between the pecuniary and nonpecuniary costs of adjustment — both are sources of individual disutility and should be weighed against the gains in utility to other members of the community from trade liberalization in arriving at a determination of whether average utility (not simply income) has been increased (Trebilcock 1985; Trebilcock and Quinn 1982). The private and psychological costs of change may be substantial (Green 1984; Olson 1985). This fact may militate against freer trade generally, but it may also have implications for compensation. For example, if compensation is structured to ensure a smoother political transition to freer trade, utilitarians require consideration of the psychological as well as the pecuniary costs of change. To the extent that freer trade harms those, such as unskilled workers, who are relatively disadvantaged, this utilitarian view may call for some compensation.

A Rawlsian distributive justice perspective is that, behind the hypothetical veil of ignorance where the social contract is constructed and where our individual lots in life and endowments are not known, everyone agrees that society should pursue no collective policy that does not improve the lot of the least advantaged. In other words, we would all agree to a form of social insurance against the risk of finding ourselves in this plight. Rawls' (1971) theory is not indifferent, however, to concerns of aggregate social welfare; he is prepared to accept the idea that distributive policies that benefit the least advantaged ought to be achieved at minimum necessary costs to other groups or to society in general. Thus, the Rawlsian perspective may call for compensation to those adversely affected by trade liberalization, particularly if they are among the most disadvantaged members of society to begin with (such as low-paid textile workers).

Communitarianism

The communitarian perspective may suggest policies that diverge considerably from those driven by utilitarian or liberal individualist frameworks. First, although the latter permit conceptualizing the psychological costs of change as real costs that may merit compensation, communitarians see the exit option — even when accompanied by compensation — as unjustified if it involves severing the bonds to extended family, neighborhood or region, and workplace colleagues. Loss of a significant part of one's human identity may simply not be compensable through redistributive policies. Policies that enhance the stay option may be preferred if they can keep intact the attachments that, according to communitarians, make life worth living. Thus, communitarian considerations clearly have implications for the formulation of adjustment policies. For example, a justifiable policy mix to address decline in a local industry may involve relocation assistance to younger workers, retraining for other sectors in the same community or region for middle-aged employees, and an early retirement package for older workers.

To economists, of course, policies that actually retard the speed of a market-driven reallocation of labor and capital are less justifiable than those that are merely compensatory. But in a morally pluralistic society, paying off the losers is not enough; the values they hold dear must continue to have a legitimate place in the policy process. This point is well put by Calabresi:

> A decision which recognizes the values on the losing side as real and significant tends to keep us from becoming callous with respect to the moralisms and beliefs that lose out....[I]t tells the losers that, though they lost, they and their values do carry weight and are recognized in our society, even when they don't win out. (1985, 109.)

Policy Instruments

Potential public policy responses to the costs of adjustment to trade liberalization fall into three major classes: trade policies, industrial subsidies, and labor market policies.

Outright trade protectionism and industrial subsidies can be thought of as *ex ante* policies designed to forestall freer trade. In contrast to some preventative measures discussed earlier, such as flood control, the actions described here prevent desirable outcomes. The gradual phase-out of trade restrictions has some of the same properties, as does reciprocity in trade concessions (although less severe). Safeguard actions, on the other hand, are *ex post* policies that nevertheless reinstate trade restrictions and hence have many of the same effects as *ex ante* restrictions except that they are temporary. Active labor market policies are *ex post* policies designed to facilitate labor market adjustments to trade liberalization.

Trade Policies

The form of the implementation of trade liberalization may itself mitigate some of the potential adjustment costs in several ways (Richardson 1980, 332–328). First, as has been the case with most major multilateral and regional initiatives in recent decades, trade liberalization can follow a gentle phase-out trajectory — such as a ten-year time frame for implementation. Such a policy has two obvious and offsetting effects. It attenuates adjustment costs by providing for an adjustment process that is temporally dispersed rather than lumpy. However, it also attenuates the benefits from trade liberalization.

Economists generally doubt that this policy is often likely to enhance economic welfare (see Kaplow 1986; Banks and Tumlir 1986), and see economic Darwinism as the best recipe for efficient adjustment. Utilitarians may see a phase-out of trade restrictions as an appropriate policy for reducing the private costs of rapid adjustment (and sources of disutility), while proponents of distributive justice may see a phase-out as appropriate for lessening the deleterious impact on the least well endowed members of society. Communitarians emphasize the importance of ensuring that communities are not destabilized by pressure for change that is too rapid or too intense. Gradual phase-out may allow for retraining or relocation to other jobs within the same community or region or for early retirement policies that can avoid the stark choice between sundering communal bonds and forcing indefinite unemployment.

Second, as contemplated in the "safeguard clause" (Article XIX) of the GATT, provision can be made for temporary reinstatement of trade protection measures if liberalization threatens serious disruption to a domestic industry and its work force. The various implications of invoking this policy response are similar to those noted above for a phase-out strategy.

Third, trade liberalization can be made conditional on reciprocal concessions by trading partners. A major advantage of reciprocity is that it provides a liberalizing country some assurance that adjustment costs caused by greater import penetration can be partially offset by increased access to export markets into which displaced resources can be redeployed (Richardson 1980, 290).

Industrial Subsidies

In many industrialized countries since the early 1970s, sectors such as shipbuilding, coal, steel, textiles, clothing and footwear, and, in some cases, automobiles have experienced substantial competitive pressures from imports (see generally Trebilcock and Howse 1999, 239–249). Countries under import pressure have often had to resort to various kinds of industrial subsidies apart from trade restrictions. In general, these subsidy policies have not been effective in avoiding the ultimate need for adjustment or moderating its severity. Pure output-related subsidies have been the least effective in that they flatly deny the need for adjustment; although they maintain employment in an industry, it can be sustained only if the subsidies are endless (and often increasing).

Other forms of industrial subsidies have been designed to facilitate the modernization of obsolete capital. The proponents argue that state assistance to facilitate capital modernization may be necessary to make a distressed industry internationally competitive again. However, obsolete plants are often the result, not the cause, of the loss of international competitiveness. Firms that are able to cover only variable costs are constrained to allow their fixed assets to run down and with them long-term capacity. If new fixed assets could garner an adequate return, private capital markets presumably would provide the funds required for the investment. A governmental judgment that such an investment would yield long-run competitiveness and profitability is typically at variance with these private capital market judgments and should, for this reason, be viewed with skepticism.

Much less frequently, industrial subsidies have been provided to ease exit costs. Japan is the country that has most prominently invoked subsidies for this purpose in industries such as coal mining and steel. It might be argued that, if plant or firm size is indivisible to some degree, such that efficient industry adjustment to a decline in demand requires that firms exit in some orderly temporal sequence, market forces may not produce this sequence. A case may thus arise for a role for government in managing adjustment to the contraction in demand, perhaps through recession cartels, active promotion of mergers, or compensation for scrapping physical capacity.

Although Japanese policies seem to have registered some successes in this context, there are reasons for caution in assigning government a proactive role in facilitating firm exit. This view assumes that government can economize on transaction costs in ways not open to private firms through mergers, specialization agreements, and other means. Also, bureaucratic involvement in detailed industrial restructuring presents clear dangers in terms of relative institutional competence and of fostering anticompetitive forms of collusion in seeking agreement on future industry structure.

More generally, the normative case for subsidies to firms in import-impacted sectors is weak. Firms may be able to use investment strategies to diversify away the risk of increased import competition. More important, shareholders in these firms can reduce it through portfolio diversification. This risk is no more serious or unforeseeable than others that firms and shareholders routinely assume; they are prepared, for example, to face the risks of technological change and shifts in consumer demand for an appropriate risk-adjusted return.

Labor Market Adjustment Policies

The case for active labor market adjustment policies is substantially more compelling (see generally Trebilcock and Howse 1999, 240–245). Under conditions of close to full employment, we have little reason to be concerned about the dislocation effects of trade liberalization. The market, in effect, will soon reabsorb the dislocated workers (although proponents of a number of ethical perspectives may find it appropriate for government to bear some of the transition costs these workers face).

If, more realistically, we assume that re-employment is likely to be far from automatic, then the question arises as to what measures are required to facilitate it. The concept of adjustment is complex. At one level, the problem may be understood as the time lag between a worker's being displaced from one job and his finding another that is an adequate replacement. From this perspective, provision of temporary income support and search, counseling, and relocation assistance seem to address the problem.

However, the fact that employment is being created primarily in sectors other than those where jobs are being lost raises serious questions about the adequacy of the unemployment insurance model. It may be necessary to go further and provide training and retraining of workers for new types of employment within the economy. This point is well expressed in the de Grandpré report, which contrasts the trampoline approach (which emphasizes training and retraining) with the unemployment insurance model (the safety net approach). The report suggests:

> The "trampoline" approach seeks to prepare Canadian workers to prosper in a world of increasing technological change and international competition, in which Canada must use its access to the larger North American market to achieve greater economies of scale and higher productivity. (Canada 1989, xvii.)

Comparative experience with labor market policies in various industrialized countries yields a very mixed record. Canada, the United Kingdom, France, the United States, and Australia tend to favor a safety net approach, rather than proactive labor market policies. In contrast, Sweden, Japan, and to a lesser extent Germany use much more proactive labor market policies — often called *active labor market policies* (ALMPs) — that provide generous assistance to workers for training, retraining, and relocation. The empirical evidence generally suggests that this class of policies is superior in facilitating adjustment, although designing effective job-training and retraining programs, particularly for unemployed youths and older workers, has proven a demanding challenge for governments, and the evidence on their efficacy is mixed (Fay 1996).

Existing ALMPs can be divided into four broad types: job-search assistance; short-term classroom training; on-the-job training (which is, in many ways, equivalent to subsidized employment); and long-term remedial training. Evaluating the net impact of ALMPs is methodologically complex. It involves taking into account, in addition to direct costs and benefits, deadweight losses (participants who would have found employment without the program), substitution losses (participants who find jobs that would have been filled by nonparticipants), and displacement losses (participants who displace currently employed nonparticipants).

In what follows, we outline the relevance of the first three types of assistance as responses to trade dislocation. Long-term remedial training, while important to job retraining in general, is not particularly relevant as a specific response to trade dislocation.

Job-Search Assistance

In both Canada and the United States, government-administered job-posting and placement programs help individuals find jobs for which they are qualified. In some cases, these programs have roughly the same success rates as the job-training programs referred to below and at much lower cost (Fay 1996, 23). The success of such measures is, however, a function of the type of unemployment problem at hand. For structural unemployment resulting from trade liberalization, mere job-search assistance cannot be effective because it does not address the basic problem: even with full information about the employment market, individuals without the requisite skills will remain unemployed. For frictional unemployment, however, this strategy is appropriate; all that is required is to provide adequate information to allow qualified workers and employers to discover one another. Since these sorts of programs are directed at different problems, we should see them not as substitutes but as complements.

Short-Term Classroom Training

In the United States, classroom training programs typically have been implemented for poor, single parents, and disadvantaged youths and adults. These targets are not people who are likely to suffer trade dislocations to the same extent as workers in vulnerable industries. However, the experience with these programs may be relevant in evaluating the usefulness of similar programs to deal with trade dislocation.

The results are not promising. Studies show only a marginal increase in employment levels and only a marginal (if any) decrease in participants' dependence on social assistance (Milhar and Smith

1997). The *Comprehensive Employment and Training Act of 1973* adopted an input-based form of contracting with public organizations to provide classroom and on-the-job training and was widely viewed as ineffectual. The *Job Training Partnership Act of 1982* sought to shift to output-based contracting with private organizations, but pervasive cream skimming of the more readily re-employed has substantially attenuated its effectiveness (Donahue 1989, chap. 9). Programs targeted to specific subgroups of the unemployed (for example, female re-entrants) have generally proven more effective than the provision of classroom training to broad classes of them (Fay 1996, 27).

In Canada, although both classroom and on-the-job training have enjoyed only moderate success, the latter has been relatively more effective in improving an individual's chances of employability (Riddell 1995). Many classroom retraining programs have been too short to impart a significant new set of skills.

In Europe, classroom training is more often coupled with on-the-job training than in North America (Treh'rning 1993). Although Sweden's classroom training programs are often cited as examples of effective labor market training, they have recently come under more critical scrutiny. Researchers have found that those individuals who acquire practical, on-the-job training in the Swedish program are more successful than those who receive classroom instruction alone, although both programs have modest effects (Regner 1993).

On-the-Job Training

On-the-job training or subsidized employment is already part of government job-training strategy in both Canada and the United States. Certain problems are evident in the system that give rise to concerns about its adequacy as a response to trade dislocation. First, most programs have been structured without the possibility of flexible adjustments to reflect changing labor market demands. Leaving the choice of skills acquired up to the individual worker would be a more efficient method of allocation. Another significant problem with current arrangements is that firms have strong incentives to spend little on training or simply do away with it altogether and exploit the opportunity to hire unskilled workers (whom they may have hired in any event) at little or no extra cost to themselves. Wage subsidy programs are often plagued by high deadweight, substitution, and displacement losses. Public employment programs tend to be temporary make-work programs with marginal effects on future employability (Fay 1996, 22).

Conclusion

This case study has reviewed rationales and instruments for intervention in response to economic dislocation caused by changes in trade policy. Such a context is an excellent place in which to review, in some detail, various labor market policies that could apply to any number of economic shocks, because such intervention may be normatively defensible in the trade context and is common in the face of liberalized trade.

Experience with trade-specific labor market policies has been mixed. For example, the US *Trade Expansion Act of 1962* and the *Trade Act of 1974* sought to provide adjustment assistance to workers dislocated by import competition. The 1962 act had very strict eligibility criteria — requiring, for example, that imports were demonstrably a more important factor than all others combined in causing injury and that tariff concessions and injury must have occurred simultaneously — and it was largely unsuccessful as an instrument of assistance. From 1962 to 1974, only 54,000 workers were certified for assistance, which involved total expenditures of US$85 million (Trebilcock 1985). Adjustment assistance grew substantially after the passage of the 1974 act, under which the level of benefits increased and the eligibility criteria were greatly relaxed. Between 1977 and 1981, 1.2 million workers received benefits. Spending under the act in 1981 reached US$1.5 billion, although subsequently the program budget was severely cut (Lawrence and Litan 1985). For the most part, however, assistance under the act turned out to be an instrument of compensation for temporarily laid-off workers in cyclical industries, rather than an instrument to promote adjustment out of declining industries (Hafbauer and Rosen 1986).

This evidence is not damning to trade-related adjustment assistance programs *as such*. Rather, it suggests that policies should be designed to ensure that priority is placed on job losses that are likely to be permanent and that eligibility criteria are not tilted in favor of sectors represented by powerful lobby groups. These points reinforce the conclusion that assistance programs must be targeted carefully at their intended beneficiaries.

A second but related argument against linking adjustment assistance with trade liberalization is that singling out trade-displaced workers from other displaced workers is morally arbitrary and unfair. This kind of argument assumes, however, that *only* trade-displaced workers are being offered assistance beyond that provided by the general social safety net (including unemployment insurance). When government provides a variety of programs that are targeted at specific groups of workers and that have a range of eligibility requirements, it is much less clear that providing a program for trade-displaced workers gives them an unfair advantage.

A third objection to adjustment assistance is more pragmatic. In many sectors undergoing major restructuring (steel and textiles, for example), it is often unclear which jobs lost are due to trade effects and which are due to technological change or declining demand. Even if causes and effects can be untangled, is it normatively defensible to offer differential treatment to workers in the same industry who are displaced for different reasons? The logic of targeting or disaggregating adjustment assistance is that workers displaced by trade liberalization may be more likely to require retraining than those who lose their jobs due to cyclical downturns or the bankruptcy of a particular firm, since trade-induced dislocation may reflect a need to restructure permanently an entire industry or sector in response to enhanced import competition. Moreover, pragmatically, political pressure against social-welfare-increasing trade liberalization may be less when assistance is offered to workers than when it is not.

10 Conclusion

In this study, we have outlined various rationales for government intervention in the face of various economic shocks. We examined the case for and against intervention arising from considerations of efficiency, distributive justice, utilitarianism, libertarianism, compensatory justice, corrective justice, and communitarianism. We also described a variety of policy tools available to governments that choose to intervene because of a shock.

The case for intervention varies considerably with context. Proponents of efficiency or distributive justice may support intervention in one context but firmly reject it in another. That is why the case studies are helpful in understanding the role of government in responding to economic shocks. Empirical evidence as to what works and what does not is of central relevance to whether a given instrument is likely in fact to vindicate a given normative rationale for intervention. The facts matter.

We also looked at economic shocks classified by their causes. Natural shocks, market shocks, and government shocks (both from mismanagement and changes in policy) all have different characteristics relevant to the case for and form of intervention.

In many contexts, perspectives on a particular type of shock or intervention may reach the same conclusion on the basis of very different reasoning. For example, adherents of efficiency, distributive justice, and communitarianism may call for some type of intervention in the face of trade liberalization. Although efficiency offers some clear arguments against compensating free trade's losers (see Kaplow 1986), it also provides arguments in support of compensation. In particular, public choice theory suggests that trade liberalization may not occur unless losers are compensated and thereby discouraged from opposing it. If workers harmed by trade liberalization tend to belong to the ranks of society's least advantaged, then distributive justice may also support intervention. Finally, if a community is jeopardized by trade dislocations, communitarianism may also call for government intervention.

Despite the various approaches' similarities in some contexts, proponents of the different perspectives take divergent views in other contexts. Efficiency theorists, for example, tend to be noninterventionist except in the presence of clear market failures (such as private insurance market failures). The reason is that they are concerned about the *ex ante* incentives created by the promise of *ex post* compensation (ibid.). Publicly subsidized programs designed to compensate people harmed by flooding, for example, may create excessive incentives to settle on territory vulnerable to floods. Libertarians, with their emphasis on individual autonomy, also tend to be noninterventionist, except when the shock involves a possible infringement of rights. On the other hand, adherents of distributive justice and communitarianism are more likely to call for intervention. Distributive justice focuses on the disproportionate impact of shocks on society's less-advantaged groups, and proponents may justify intervention in order to mitigate this impact. Communitarianism, by its very nature, takes communities as given, and proponents are less concerned about the *ex ante* incentives associated with intervention; rather, they care about dealing *ex post* with a particular shock's harmful effects on the community in question.

None of the normative justifications for intervention is so open-ended in its application that wide-ranging intervention is easily justified. Distributive justice is concerned only about members of disadvantaged segments of society and, in its Rawlsian form, is concerned only about the least advantaged. The implication is that a great number of economic shocks, such as those that cause upheaval to educated workers (for example, liberalizing trade in the professions), do not invite intervention on the basis of distributive justice. Utilitarian distributive justice is also limited in that it demands accounting for the costs of intervention; even if a policy may have salutary effects on distribution, utilitarian distributive justice may oppose it if it is too costly. Communitarianism invites intervention only when a shock jeopardizes an established community. If trade liberalization were to cause upheaval in small sectors of a large city's economy, concerns for community are unlikely to justify intervention.

The Case Studies

In reviewing the empirical evidence presented in the case studies, we believe that several important generalizations are warranted. First, government interventions that are designed to defy or deny the efficient allocation or reallocation of resources in response to economic shocks are likely to be extremely costly, in part because, almost by definition, they are likely to be of indefinite duration. Thus, in the case of periodic natural shocks, such as flooding, the provision of unconditional relief whenever disaster occurs creates a serious moral hazard problem; the benefits severely mute the incentives for residents, farmers, businesses, and communities to adopt precautionary strategies, such as relocation of homes to flood-free areas, flood proofing of homes, zoning restrictions, and construction of dikes and levies. *Ex post* relief payments or other forms of *ad hoc* intervention that fail to address the root problems of the floods only serve to exacerbate the long-run costs of floods.

In the case of market shocks, such as the oil shocks of 1973 and 1979, government attempts to suppress the movement of domestic prices to world prices, in the interest of cushioning the impact on consumers, severely mute incentives both on the demand side to adopt efficient conservation measures and on the supply side to invest in exploration activities designed to increase the supply of new, marginal sources of energy. In the case of agricultural commodity price volatility, attempts to raise prices through marketing boards or supply management schemes hurt all consumers, in particular those with low incomes (and are thus regressive in their impacts) while conferring benefits indiscriminately on all farmers, large and small, and suppressing their incentives to adopt efficient, self-sustaining forms of production.

With respect to government shocks, such as mismanagement of the east coast cod fishery, legal or at least political imperatives to pay compensation to those economically prejudiced by government action or inaction may enhance governments' incentives to adopt policies that reduce the risk of mismanagement in the first place. On the other hand, given the fact of mismanagement and its consequences for the state of the fishery, unconditional payments to those injured mute the recipients' incentives to reallocate their resources to new and self-sustaining economic activities. In the case of trade liberalization, policies designed to maintain protectionism entail costs for consumers that vastly outweigh any benefits to producers. Similarly, industrial subsidies, employment maintenance, and unconditional unemployment insurance policies designed to avoid the economic adjustments required by trade liberalization are likely to prove extremely costly forms of intervention of indefinite duration.

A second and related conclusion that emerges from the case studies is that, in assisting individuals or businesses to adjust to a new and efficient equilibrium following one of the kinds of economic shocks reviewed in this study, distributive justice concerns may well warrant some form of assistance. In general, however, in order to contain the costs of such intervention, it should take the form of targeted, time-limited assistance restricted to low-income individuals and, following the lesson of the first conclusion, should be made conditional on taking courses of action that reduce the probability of recurrent future claims for assistance. For example, with respect to natural shocks, such as flooding, government may be justified in mandating as a condition of mortgage financing the securing of adequate flood or crop insurance (to internalize the costs of locational decisions); providing financial assistance to low-income inhabitants of flood-prone areas who lack adequate resources to relocate or flood-proof homes may also be defensible. In the case of market shocks, the provision of temporary financial assistance to low-income consumers to enable them to adjust to world prices may be justified. In the case of agricultural price volatility, temporary financial assistance to low-income farmers may be justified pending negotiations of effective international constraints on trade-distorting tariffs, quotas, and subsidies in the sector. In the case of government shocks, such as mismanagement of the cod fishery, assistance to displaced workers should be targeted on those with low incomes and conditioned on taking actions such as job training, relocation, or investment in self-employment in other sectors. With respect to trade liberalization, assistance should be targeted on low-income, displaced workers and again conditioned on job relocation, job training, and self-employment efforts in other sectors.

A third conclusion that emerges from the case studies relates to communitarian rationales for preserving existing communities and the social networks they entail. Obviously, assisting individuals to adopt adjustment strategies in the face of economic shocks is often in tension with these rationales for maintaining the social status quo, but, as the case studies demonstrate, preserving that status quo in all respects is likely to be an extremely costly and perpetual commitment. Moreover, it is likely, in many cases, to prove counterproductive in terms of communitarian values themselves. Preserving noneconomically self-sustaining communities, with high levels of unemployment and the social pathologies often associated therewith, provides no assurance of the preservation of vital, vibrant communities but rather perpetuates increasingly dysfunctional communities. A point to remember in assisting existing communities to adjust to economic change is that distance matters less to many economic activities today than in the past, in part due to technological innovations in the communications and transportation industries and in part because many new economic activities do not depend centrally on physical proximity to their markets. Thus, in regions that have been disadvantaged by economic shocks, government investment in human capital through the maintenance of a high-quality educational system, along with investments in physical and other forms of social infrastructure, is likely to provide an environment conducive to investments in new forms of economic activity. In addition, while the empirical evidence suggests that governments face major risks in attempting to pick and support highly targeted forms of economic winners, more general time-limited tax concessions to firms prepared to locate activities in disadvantaged regions may be a useful complement to general investment in educational, physical, and social infrastructure.

A fourth conclusion that emerges from the case studies is that, despite the variety of coherent normative justifications for intervention in the face of different shocks, the empirical evidence is that governments often do not intervene in an effective way. Moreover, they sometimes intervene where there is no cogent basis for doing so. Examples of possibly appropriate but ill-managed intervention are found in the cases of floods and government mismanagement. With respect to floods, by persistently offering financial assistance to those disadvantaged by flooding, governments have created an expectation of future disaster relief, which increases the cost of future floods by failing to discourage settlement on floodplains. Even if, for example, communitarianism justifies some form of protection for existing communities from the economic dislocation caused by flooding, *ex post* relief is likely to be inferior to structural flood-prevention measures. Yet governments have tended to take an *ad hoc* approach to these matters. The case of the east coast cod fishery provides another example of how government intervention of some sort is justifiable on criteria such as distributive and corrective justice, yet the actual interventions have tended to be unsuccessful. Programs such as income replacement fail to address the long-term structural problems that Atlantic Canada faced following the collapse of the fishery. An example of government intervention that appears to lack a strong normative basis for intervention at all is agricultural price supports. Notwithstanding marketing boards' inefficiency, their perverse distributive effects, and their failure to sustain family farms rather than large commercial enterprises, governments in Canada continue to support them.

In conclusion, the evidence provided by the case studies is that governments often fail when intervening in the face of economic shocks. In setting out policy prescriptions, it is thus important to consider why governments fail and whether a particular proposed policy advances some normative goal or is the result of government failure. We offer some suggestions below, focusing in particular on public choice theory and what can be done about it.

The Limitations on Government

Before turning to the more general implications of our analysis for the optimal policymaking process, we point out important institutional considerations that we do not explore in detail. We have not considered important constraints on government actors that may limit efforts to intervene in the face of economic shocks. In particular, both domestic and international constraints on government action may exist. Domestic constitutions may constrain a particular level of government from intervening in a particular way. For example, a national government may be best placed to intervene in the face of natural shocks, in the sense that the costs of the implicit insurance can be spread across a large population, but constitutional responsibility for intervention may, in important dimensions, lie with subnational governments. Limitations on government action may also arise from international treaties and obligations. Even if a national government would be justified in helping a particular sector of its economy respond to a drop in demand, trade agreements may constrain it from subsidizing the industry. Other international limitations may result simply from global markets. For example, in a worldwide market, a single government's attempt to manipulate the world price is doomed to failure.

Another limitation on government action results from important deficiencies in the policymaking process. We consider public choice questions below, but we point out here the potential importance of significant informational constraints on policymakers. In the real world, policymakers are likely to be confronted with both too much and not enough information relevant to intervention in the face of economic shocks. Despite the likely plethora of information on the impact of a shock on a particular sector, isolating causal relationships may be difficult. For example, a natural shock may render a floodplain infertile for a period, but this fact does not necessarily allow government to infer what market conditions — such as world prices, crop yields, and types of crop planted — would have prevailed in the absence of the flood. More significantly, even experts often find it difficult to predict how government intervention will affect economic conditions in the sector. Will intervention preserve a community, for example, or simply delay its disintegration for a period? In addition, predicting how intervention in one sector will affect other sectors is very difficult. Will preserving a community in one place exacerbate conditions in a different community? Such questions are complex.

Despite these considerable informational problems for governments considering intervention, we do not believe that they always militate in favor of nonintervention. Governments in a wide variety of settings are faced with such constraints, yet policy is made. As Lindblom has argued, in some instances the best that can be done is to muddle through the obstacles presented by scarce information and bounded rationality (1959, 1990). Governments should take seriously the informational constraints they face and not ignore their implications, yet they should not refrain from action altogether — requiring perfect information would simply result in policy paralysis. Lindblom suggests that governments should choose policy through incremental comparisons of policies, moving at the margins and constantly adjusting their approach.

Optimal Policymaking

Having set out these important constraints on government, we turn to some implications of our analysis for an optimal policymaking process. As the case studies demonstrate, the perspectives canvassed here sometimes align in their approaches to intervention in a particular context, but so too do they differ in other contexts. These differences in approach are, in some instances, irreconcilable. We have no overarching theory that allows policymakers to determine when a particular normative rationale ought to be paramount in deliberations over intervention, but rather we point out how the policymaking process can be disciplined through asking the right questions. Again, Lindblom (1959) provides useful advice. When disagreement over the most important value to be vindicated in a particular policy context is insurmountable — and such disagreements are legion in practice — administrators and their critics should focus on particular policies, rather than on values in the abstract. This advice may be particularly useful in the context of intervention with respect to economic shocks since analysis reveals that different normative approaches sometimes align in their policy prescriptions here. Of course, where the normative frameworks differ in their identification of acceptable policies, political conflict is unavoidable.

Interest Groups

The potential differences in approach across normative frameworks raise a danger that we have yet to discuss in detail: public choice or political economy concerns about the political influence of interest groups. That is to say, as the case studies appear to demonstrate, while markets may sometimes fail, government failure is also possible, so that intervention occurs when no normative justification for it exists or, when such justification exists, the form of intervention does not vindicate it. Wherever an accepted role of government is to intervene and compensate various groups suffering from an economic shock, interest groups may influence policy. The effects of the shock may galvanize pre-existing interest groups into lobbying for relief. For example, agricultural interest groups may react to low commodity prices by lobbying government for assistance. The shock may also define an interest group for the purposes of lobbying. Where the shock has relatively focused effects, as many of the shocks considered here do, a focused interest group may emerge. Flood victims, for example, may coalesce into an interest group.

Public choice theory predicts that focused or concentrated interest groups, because of their ability to overcome free riding, are better able to influence the political process than diffuse groups (see Trebilcock et al.). The implication is that interest groups may succeed in securing political intervention on their behalf even in the absence of a compelling normative justification. This situation may be particularly likely with geographically concentrated interest groups. An interest group that is geographically concentrated is likely to have a political impact exceeding that of a group that is geographically diffuse because a concentration of voters has a greater effect on the local politicians' prospects for electoral success, while a diffuse group may not be able to threaten any politician in particular with electoral disapproval. The ability to enlist the support of local politicians suggests, in turn, a relatively significant influence on government policy.

Many economic shocks have geographically concentrated effects: floods and other natural disasters are inherently localized; agricultural price shocks are likely to affect farmers of a particular region disproportionately; and government mismanagement of natural resources often has geographically bounded effects. The impetus to interest group activity that a shock provides and the high potential for the geographic concentration of shock-related interest groups suggest that the threat of interest group influence on government reaction to a shock is significant.

The potential political influence of interest groups plus the divergent views on some shocks taken by different normative perspectives on the question of intervention form a potentially dangerous combination. The politician who is able to point publicly to some normative justification for intervention may be more susceptible to interest group influence since any political costs of bowing to pressure may be mitigated by the politician's ability to proffer an ostensibly principled justification for his or her actions and hence engage the sympathies of other constituencies committed to this value. Moreover, those seeking to enlist normative support may seek to characterize the shock in a manner that is most likely to justify intervention. Those supporting intervention in the cod fishery, for example, may describe the depletion of cod stocks as induced by government negligence, a characterization that may justify government response. On the other hand, those opposed to intervention may choose to characterize the fishery's decline as a natural shock, which government need not address. Either drawing on the broad range of normative approaches or by strategically characterizing a shock, a supporter of intervention may have significant latitude in proffering normative justifications. Of course, if broad public perceptions of political decisions are irrelevant, then a coherent normative basis for intervention may also be irrelevant to the politician. But where public perceptions matter, political actors' choice of a range of justifications for intervention and of a range of plausible characterizations of a shock gives them leeway.

Inevitable Interventions

In light of both the dangers of interest group capture that public choice theory points out and the variety of normative approaches — and thus public justifications for intervention — at the disposal of government, the socially preferable choice might be never to intervene in the face of a shock. This approach might avoid more inefficient and otherwise undesirable interventions than those that would be efficient and desirable. However, an outright preclusion of such intervention is unrealistic, given the existence of normative justifications for intervention in some cases and the inevitable existence of politically influential interest groups.

Notwithstanding the dangers of interest group influence, the certainty of some intervention in the face of shocks is not necessarily cause for despair. As one of us has concluded in the face of significant deregulatory efforts in recent years, ideas do matter in the political marketplace (Trebilcock 1999). In many instances, no coherent normative basis for intervention exists; as noted, these frameworks are not open ended in their support for public intervention. Despite the clear danger of interest group capture, the lack of a coherent basis for intervention may succeed in deterring intervention in some circumstances. Although agricultural price support policies remain strong, for example, they have diminished in importance in recent years — a trend that is destined to continue in the future as the result of continuing trade liberalization. Moreover, when a basis for intervention exists, government may be constrained by agreement among perspectives. In a range of cases, different perspectives will align in their prescriptions for dealing with a particular economic shock.

The Right Questions for Policymakers

Accepting that government has the discretion to intervene does not mean that sensitivity to the dangers of interest group influence is not warranted. In our view, this sensitivity should encourage policymakers — and their scrutineers — to ask the right questions in thinking about intervention. Although certainly not a guarantee, asking the right questions helps to ensure that the analysis is not sidetracked by self-interested lobbying.

What are the right questions in this context? This paper has focused on two categories of questions of particular importance: What are the policy objectives justifying intervention? What instruments of intervention are appropriate?

The Policy Objectives

It is crucial for policymakers to identify clearly the objective behind any type of intervention responding to economic shocks. Ascertaining the central objective of intervention will serve at least two important purposes. First, the choice of policy objective considerably limits the scope for political discretion. Economic efficiency and libertarian considerations tend to be limited in their support for intervention, while other frameworks, such as distributive justice and communitarianism, may be more inclined to support intervention but do not give policymakers *carte blanche* to intervene regardless of the type of shock or the affected parties. If an earthquake strikes and the policy objective is identified as distributive justice, it is unlikely to be a coherent basis for government assistance to victims of damage in a wealthy part of a city. On the other hand, it may justify assistance if the earthquake damaged a poor area. Clearly identifying the objective provides a standard against which to judge whether intervention of any kind is normatively justified and helps to guard against unprincipled capitulation to interest group lobbying.

Second, the choice of policy objective provides a standard against which to judge the type of intervention chosen. That is, is it rationally connected to the objective? If a policymaker sets out to justify intervention on the grounds of economic efficiency, his choice of instruments is limited to those that address issues of market failure. Having the objective provide grounds for evaluating intervention is helpful not only in the initial choice of instrument but also in evaluating the success of the intervention over time. The objective provides criteria for judging a program that responds to an economic shock.

The Instrument Used

The second set of questions, which relate to the choice of instrument, is twofold: Does the instrument in practice advance or achieve its stated objective? What public and private costs are entailed in its deployment?

The first point requires an evaluation of whether, as a positive or descriptive matter, the instrument succeeds in advancing the normative objective behind the intervention. With respect to each policy objective identified in this study, there is likely to be a wide range of policy instruments available to government. These need to be evaluated and re-evaluated comparatively, in light of experience with their use in both the jurisdiction in question in the past and in other jurisdictions currently or historically. Historical and comparative empirical evidence should be critical to the choice of policy instrument or combination of instruments.

Two problems may arise in practice with respect to any type of intervention. First, the policy instrument may simply fail to achieve its stated goal. Suppose, for example, that assistance to fishermen is intended, on a communitarian basis, to preserve long-standing fishing villages in an area where fish stocks have been depleted, yet the evidence is overwhelming that people face no other employment prospects in their existing communities. Intervention clearly cannot succeed in achieving the communitarian objective of maintaining viable communities. A second, potentially more serious, concern is that the policy instrument may actually exacerbate the problem identified as justifying intervention. Suppose, for example, that government intervenes, on economic efficiency grounds, to provide implicit flood insurance to people living on a floodplain where private flood insurance is unavailable because of market failure (such as the difficulty of insuring highly correlated risks). Such a program may be highly inefficient because it implies that people do not bear the full costs of living in this locality; they externalize the costs of doing so to taxpayers. It may be that, if people living on the floodplain had to bear the actuarially fair costs of flood insurance, they would move. Thus the implicit insurance scheme entailed by *ex post* assistance for flood victims creates a social deadweight loss and harms economic efficiency.

The second question to ask with respect to the choice of policy instrument is: What are the public and private costs of the instrument? Even supposing an instrument is effective in achieving its objective, the availability of an effective alternative that is less costly is clearly relevant. The significance of the cost depends to some extent on the objective behind the intervention. Economic efficiency explicitly requires an analysis of the cost, while communitarians, if not unconcerned about the costs of preserving a community, are less concerned about the costs of intervention and would argue that the alternative costs of allowing a community to disappear are extremely difficult to measure. In other circumstances, cost enters the analysis at an intermediate level of importance. For example, utilitarians may be concerned about the distribution of wealth, and thus may support interventions designed to ameliorate the conditions of the disadvantaged, but not at any price.

Summary and Conclusion

In summary, when considering intervention, the following questions are appropriate. First, what is the normative objective of the intervention? This fundamental inquiry entails two further questions: Is any intervention justified? Does the policy instrument being considered address this objective? The second fundamental question is: What policy instrument is appropriate? In asking this question, it is appropriate to ask: Does the instrument in question have any significant effect in furthering the objective, or is it ineffective or even harmful? What costs are entailed?

We do not wish to give the impression that these questions are easily answered. It may be, as Lindblom (1959) suggests, difficult to describe the normative goal or goals of a policy in the abstract. Particularly when tradeoffs between incommensurable values are involved, the response in a specific case may require identifying particular policy options in order to evaluate the normative objectives in a meaningful way. Rather than stating, for example, "three parts efficiency, one part distributive justice," describing normative priorities may require the identification and evaluation of a particular policy option relative to other options.

Notwithstanding these difficulties, we believe that it is important to make these evaluative attempts. Even if abstract analysis is difficult, it is useful, when comparing actual policies, to ask what goals they are vindicating and whether the instruments chosen are appropriate. Asking the right questions is no guarantee that government will not simply capitulate to interest group lobbying. Even within the framework set out, intervention that simply panders to interest groups can masquerade as principled. Asking the right questions can, however, discipline the decisionmaking process considerably. It can reveal situations that offer no basis for intervention and choices of policy instruments that are inappropriate because they do not relate to the stated objective or are ineffective, harmful, or too costly. Such analysis can both help policymakers acting in good faith and discipline those who are tempted to serve the goals of concentrated interests, rather than those of society at large. We do not wish to exaggerate the capacity of social science research to yield conclusive answers to these questions (see Lindblom 1990). But without some structure to the inquiry and some openness to taking the facts seriously, policymaking risks becoming "a random walk in socio-economic space" (Buchanan 1986, 167).

Finally, with respect to the questions posed above, attention needs to be paid to the design of institutional structures and decisionmaking processes, in terms of both policymaking, where initial policy responses are formulated, and the ongoing implementation of the chosen policies. The substantive questions posed above cannot be considered in an institutional vacuum. Who asks the questions, who answers them, and how the answers are formulated and implemented are critical questions. These institutional dimensions of policymaking are likely to be of acute importance in contexts such as economic shocks, where decisions must often be made in an atmosphere of crisis. Crises present both opportunities and risks — opportunities for rethinking established paradigms in innovative ways, and risks of precipitous action that may respond to symptoms rather than to underlying causes and may indeed exacerbate the latter in the long run. Ideas, interests, and institutions need to be combined in judicious ways to ensure that values of political legitimacy, creativity, institutional transparency, and inclusiveness are vindicated (Trebilcock and Daniels 2000). In short, how the questions posed above get answered and implemented may be as important as the questions themselves. These institutional questions, which are largely unexplored in this study, would provide a fruitful area for further research into the policy implications of economic shocks.

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economic Shocks

Defining a Role for Government

Edward M. Iacobucci, Michael J. Trebilcock, and Huma Haider

Devastating floods and other natural calamities, economic upheaval caused by drastic changes in domestic and international markets, and government policy or plain economic mismanagement — all these events can cause acute economic shocks to the people of a region or to a sector of the economy. In such circumstances, what is the appropriate role, if any, for government?

This sweeping study examines the types of economic shocks that can occur, the rationales governments use to justify their response to shocks, and the policy tools available to governments that are considering intervention.

At the heart of the monograph are case studies of recent economic shocks and how governments responded to them. Natural shocks are represented by the massive floods that occurred in the US Midwest in 1993 and in the Red River Valley in 1997. For market shocks, the authors look at the oil price shocks of the 1970s and the hardships caused by the volatility of agricultural commodity prices. And for examples of government-induced shocks, there are the Canadian federal government's mismanagement of the east coast cod fishery and the dislocations and transition costs wrought by trade liberalization in some sectors of the Canadian economy.

The authors argue that the lessons learned from these case studies can help discipline governments in their response to economic shocks.

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